10/030928 Rec'd PCT/PTO 11 JAN 2002

FORM PTO-1390 (REV. 9-2001) U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: Mo-6884/LeA 33,871

U.S. APPLICATION NO. (If known, see 37 CFR 1.5): To Be Assigned

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP00/06276	04 July 2000 (4.07.00)	15 July 1999 (15.07.99)

TITLE OF INVENTION: SUBSTITUTED THIENE-3-YL-SULFONYL AMINO(THIO)CARBONYL-TRIAZOLIN(THI)ONES

APPLICANT(S) FOR DO/EO/US: GESING, Ernst Rudolf F.; KLUTH, Joachim; MULLER, Klaus-Helmut; DREWES, Mark Wilhelm; DAHMEN, Peter; FEUCHT, Dieter and PONTZEN, Rolf

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. [X] The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [X] is attached hereto (required only if not communicated by the International Bureau).
   b. [ ] has been communicated by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. [X] is attached hereto.
   b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).
7. [ ] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are attached hereto (required only if not communicated by the International Bureau).
   b. [ ] have been communicated by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. [X] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [X] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
14. [ ] A SECOND or SUBSEQUENT preliminary amendment.
15. [ ] A substitute specification.
16. [ ] A change of power of attorney and/or address letter.
17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. [ ] A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. [ ] Other items or information:

JC13 Rec'd PCT/PTO 11 JAN 2002

U S APPLICATION NO (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
To Be Assigned 10/030928	PCT/EP00/06276	Mo-6884/LeA 33,871

21. [X] The following fees are submitted:

	CALCULATIONS PTO USE ONLY
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):	
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1040.00**	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$890.00**	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$740.00**	
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$710.00**	
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 890.00
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	9 - 20 =	0	x **$18.00**	$ 0.00
Independent claims	1 - 3 =	0	x **$84.00**	$ 0.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$280.00**	$ 0.00
TOTAL OF ABOVE CALCULATIONS =				$ 890.00
[ ] Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.			+	$ 0.00
SUBTOTAL =				$ 890.00
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$ 0.00
TOTAL NATIONAL FEE =				$ 890.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$ 40.00
TOTAL FEES ENCLOSED =				$ 930.00
			Amount to be refunded:	$
			charged:	$

a. [ ] A check in the amount of $ _____ to cover the above fees is enclosed.

b. [X] Please charge my Deposit Account No. 13-3848 in the amount of $ 930.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 13-3848 . A duplicate copy of this sheet is enclosed.

d. [ ] Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

00157
PATENT TRADEMARK OFFICE

Raymond J. Harmuth
SIGNATURE

Raymond J. Harmuth
NAME

33,896
REGISTRATION NUMBER

10/030928
JC13 Rec'd PCT/PTO 11 JAN 2002

PATENT APPLICATION
Mo-6884
LeA 33,871

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF	)	
	)	
ERNST GESING ET AL	)	PCT/EP00/06276
	)	
SERIAL NUMBER: TO BE ASSIGNED	)	
	)	
FILED: HEREWITH	)	
	)	
TITLE: SUBSTITUTED THIEN-3-YL-SULPHONYLAMINO(THIO) CARBONYL-TRIAZOLIN(ETHI)ONES	)	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Upon the granting of a serial number and filing date and prior to the examination of the subject application, kindly amend the application as follows:

"Express Mail" mailing label number EL700175920US
Date of Deposit January 11, 2002

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner of Patents and Trademarks, Washington, D.C. 20231

Donna J. Veatch
(Name of person mailing paper or fee)

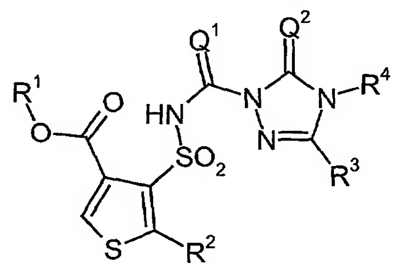
(Signature of person mailing paper or fee)

IN THE CLAIMS:

Please amend the claims as follows. A marked up copy of the claims to show changes is attached to this Preliminary Amendment.

Please cancel Claim 9 and amend Claims 1-8 and 10 as follows.

1. (Once Amended) A compound of the formula (I)



(I)

wherein

Q^1 represents O or S ,

Q^2 represents O or S ,

R^1 represents in each case optionally substituted alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl, heterocyclyl or heterocyclyl-alkyl,

R^2 represents hydrogen, cyano, nitro, halogen or represents in each case optionally substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkyl-sulphinyl, alkylsulphonyl, alkenyl, alkinyl, alkenyloxy or alkinyloxy,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, halogen or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylthio, alkylamino, alkylcarbonylamino, alkenyloxy, alkinyl-oxy, alkenylthio, alkinylthio, alkenylamino, alkinylamino, dialkylamino,

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aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio, cycloalkylalkylamino, aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino, and

R^4 represents hydrogen, hydroxyl, amino, cyano, represents alkylideneamino or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylamino, alkyl-carbonylamino, alkenyloxy, dialkylamino, cycloalkyl, cycloalkylamino, cycloalkylalkyl, aryl or arylalkyl, or

R^3 and R^4 together represent optionally branched alkanediyl,
or one or more salts of the compound of the formula (I).

2. (Once Amended) The compound according to Claim 1, wherein

Q^1 represents O or S,

Q^2 represents O or S,

R^1 represents optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally cyano- or halogen-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally cyano-, halogen- or C_1-C_4-alkyl-substituted cycloalkyl or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the cycloalkyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted heterocyclyl or heterocyclylalkyl having in each case up to 6

substituted heterocyclyl or heterocyclylalkyl having in each case up to 6 carbon atoms and additionally 1 to 4 nitrogen atoms and/or 1 to 2 oxygen or sulphur atoms in the heterocyclyl group and optionally 1 to 4 carbon atoms in the alkyl moiety,

R^2 represents hydrogen, cyano, nitro, halogen, represents in each case optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkylsulphinyl or alkylsulphonyl having in each case 1 to 6 carbon atoms in the alkyl group, or represents in each case optionally cyano- or halogen-substituted alkenyl, alkinyl, alkenyloxy or alkinyloxy having in each case 2 to 6 carbon atoms in the alkenyl or alkinyl group,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, iodine, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-substituted alkoxy, alkylthio, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy, alkinyloxy, alkenylthio, alkinylthio, alkenylamino or alkinylamino having in each case 3 to 6 carbon atoms in the alkenyl or alkinyl group, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally methyl- and/or ethyl-substituted aziridino, pyrrolidino, piperidino or morpholino, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio or cycloalkylalkylamino

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having in each case 3 to 6 carbon atoms in the cycloalkyl or cycloalkenyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl-, C_1-C_4-alkoxy- and/or C_1-C_4-alkoxy-carbonyl-substituted aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, and

R^4 represents hydrogen, hydroxyl, amino, cyano, represents C_2-C_{10}-alkylideneamino, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-substituted alkoxy, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy having 3 to 6 carbon atoms, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl, cycloalkylamino or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the alkyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl- and/or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or

Date: 2000-02-04

R^3 and R^4 together represent optionally branched alkanediyl having 3 to 6 carbon atoms,

and a sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salt of said compound of the formula (I).

3. (Once Amended) The compound according to Claim 1 wherein

Q^1 represents O or S ,

Q^2 represents O or S ,

R^1 represents in each case optionally cyano-, fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl or butinyl, represents in each case optionally cyano-, fluorine-, chlorine-, methyl- or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, trifluoromethyl-, methoxy-, ethoxy-, n- or i-propoxy-, difluoromethoxy- or trifluoromethoxy-substituted phenyl, phenylmethyl or phenylethyl, or represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, methoxy-, ethoxy-, n- or i-propoxy-substituted heterocyclyl or hetero-cyclylmethyl, where the heterocyclyl group is in each case selected from the group consisting of oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl, tetrahydrothienyl,

R^2 represents hydrogen, cyano, fluorine, chlorine, bromine, represents in each case optionally cyano-, fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, methoxy, ethoxy, n- or i-propoxy, methoxycarbonyl, ethoxycarbonyl, n- or i-propoxycarbonyl, methylthio, ethylthio, n- or i-propylthio, methylsulphinyl, ethylsulphinyl, methylsulphonyl or ethylsulphonyl, or represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl, butinyl, propenyloxy, butenyloxy, propinyloxy or butinyloxy,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy, acetyl-, propionyl-, n- or i-butyroyl-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, ethinyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, acetylamino or propionylamino, represents propenyloxy, butenyloxy, ethinyloxy, propinyloxy, butinyloxy, propenylthio, butenylthio, propinylthio, butinylthio, propenylamino, butenylamino, propinylamino or butinylamino, represents dimethylamino, diethylamino or dipropylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopentenyl, cyclohexenyl, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, cyclopropylthio, cyclobutylthio, cyclopentylthio, cyclohexylthio, cyclopropylamino, cyclobutylamino, cyclo-

pentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclopropylmethoxy, cyclobutyl-methoxy, cyclopentylmethoxy, cyclohexylmethoxy, cyclopropylmethyl-thio, cyclobutylmethylthio, cyclopentylmethylthio, cyclohexylmethylthio, cyclopropylmethylamino, cyclobutylmethylamino, cyclopentylmethyl-amino or cyclohexylmethylamino, or represents in each case optionally fluorine-, chlorine-, bromine-, methyl-, trifluoromethyl-, methoxy- or methoxy-carbonyl-substituted phenyl, benzyl, phenoxy, benzyloxy, phenylthio, benzylthio, phenylamino or benzylamino, and

R^4 represents hydrogen, hydroxyl, amino, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy or butenyloxy, represents dimethylamino or diethylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropyl-amino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclo-propylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, or represents in each case optionally fluorine-, chlorine-, methyl-, tri-fluoromethyl- and/or methoxy-substituted phenyl or benzyl, or

R^3 and R^4 together represent trimethylene (propane-1,3-diyl), tetramethylene (butane-1,4-diyl) or pentamethylene (pentane-1,5-diyl),

and a sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-

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(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salt of said compound.

4. (Once Amended) A compound according to Claim 1 wherein

Q^1 represents O ,

Q^2 represents O ,

R^1 represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl,

R^2 represents fluorine, chlorine, bromine or represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl,

R^3 represents hydrogen, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case optionally fluorine- or chlorine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methoxy, ethoxy, n- or i-propoxy, methylthio, ethylthio, n- or i-propylthio, methyl-amino, ethylamino, n- or i-propylamino, represents propenyloxy, propinyloxy, propenylthio, propinylthio, propenylamino or propinyl-amino, represents dimethylamino or diethylamino, represents in each case optionally fluorine-, chlorine- or methyl-substituted cyclopropyl, cyclopropyloxy, cyclopropylmethyl or cyclopropylmethoxy, and

R^4 represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case

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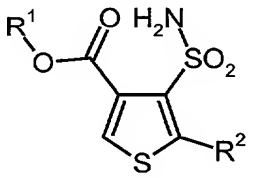
optionally fluorine- or chlorine-substituted ethenyl, propenyl or propinyl, represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, represents methyl-amino, or represents cyclopropyl,

and a sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salt of said compound.

5. (Once Amended) A process for preparing a compound according to Claim 1 , said process being selected from the group consisting of process (a), process (b), process (c), process (d) and process (e), wherein

(a) said process (a) comprises the step of reacting a substituted thiophene-3-sulphonamide of the formula (II)

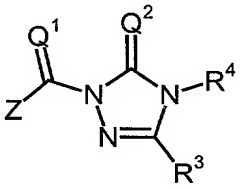


(II)

wherein

R^1 and R^2 are each as defined in Claim 1

with a substituted triazolin(ethi)one of the formula (III)



(III)

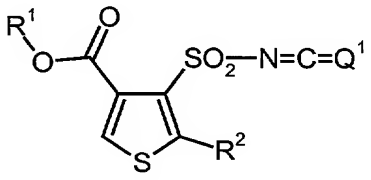
wherein

Q^1, Q^2, R^3 and R^4 are each as defined in Claim 1 and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

optionally in the presence of a reaction auxiliary and optionally in the presence of a diluent,

(b) said process (b) comprises the step of reacting a substituted thien-3-yl-sulphonyl iso(thio)cyanate of the formula (IV)

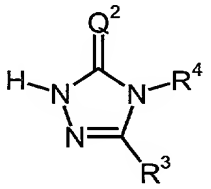


(IV)

wherein

Q^1, R^1 and R^2 are each as defined in Claim 1 ,

with a triazolin(ethi)one of the formula (V)



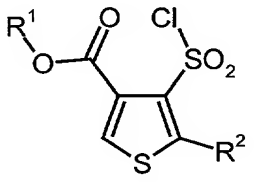
(V)

wherein

Q^2, R^4 and R^5 are each as defined in Claim 1 ,

optionally in the presence of a reaction auxiliary and optionally in the presence of a diluent,

(c) said process (c) comprises the step of reacting a substituted thiophene-3-sulphonyl chloride of the formula (VI)

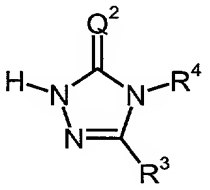


(VI)

wherein

R^1 and R^2 are each as defined in Claim 1 ,

with a triazolin(ethi)one of the formula (V)



(V)

wherein

Q^2, R^4 and R^5 are each as defined in Claim 1

and a metal (thio)cyanate of the formula (VII)

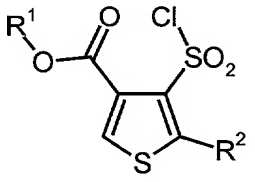
$$M\text{-}Q^1\text{-}CN \qquad \text{(VII)}$$

wherein

Q^1 is as defined in Claim 1 ,

optionally in the presence of a reaction auxiliary and optionally in the presence of a diluent,

(d) said process (d) comprises the step of reacting a substituted thiophene-3-sulphonyl chloride of the formula (VI)

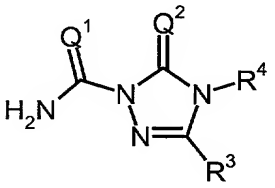


(VI)

wherein

R^1 and R^2 are each as defined in Claim 1

with a triazolin(ethi)one-(thio)carboxamide of the formula (VIII)



(VIII)

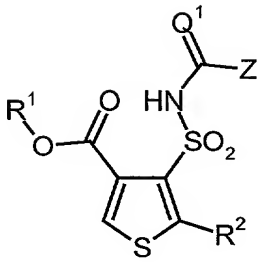
wherein

Q^1, Q^2, R^3 and R^4 are each as defined in Claim 1 ,

optionally in the presence of a reaction auxiliary and optionally in the presence of a diluent,

and

(e) said process (e) comprises the step of reacting a substituted thien-3-yl-sulphonylamino(thio)carbonyl compound of the formula (IX)



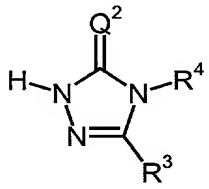
(IX)

wherein

Q^1, R^1 and R^2 are each as defined in Claim 1 and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

with a triazolin(ethi)one of the formula (V)



(V)

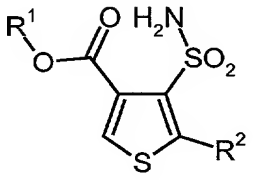
wherein

Q^2, R^4 and R^5 are each as defined in Claim 1 ,

optionally in the presence of a reaction auxiliary and optionally in the presence of a diluent,

wherein each of said processes (a), (b), (c), (d) and (e) further optionally comprises the step of converting the compound of the formula (I) obtained by said processes (a), (b), (c), (d) and (e), into a salt.

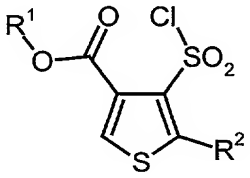
6. (Once Amended) A compound of the formula (II)



(II)

wherein R^1 and R^2 are each as defined in Claim 1 , excluding the compound 4-methoxycarbonyl-thiophene-3-sulphonamide.

7. (Once Amended) A compound of the formula (VI)



(VI)

wherein R^1 and R^2 are each as defined in Claim 1 , excluding the compound 4-methoxycarbonyl-thiophene-3-sulphonyl chloride.

8. (Once Amended) A method for controlling undesirable vegetation, comprising the step of allowing one or more compounds according to Claim 1 to act on a member selected from the group consisting of an undesirable plant, a habitat of said undesirable plant and combinations thereof.

10. (Once Amended) An herbicidal composition comprising one or more compounds according to Claim 1 and a member selected from the group consisting of one or more extenders, one or more surfactants, and combinations thereof.

REMARKS

This amendment is made to place the claims in conformance with U.S. patent practice. This amendment is not in derogation of any prior art, and Applicant respectfully asserts that it is entitled to the claims as amended and any equivalents thereof.

Respectfully submitted,

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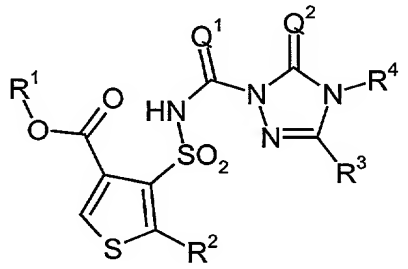
VERSION MARKED TO SHOW CHANGES

IN THE CLAIMS:

Please cancel Claim 9 and amend Claims 1-8 and 10 as follows:

1. (Once Amended) A ~~C~~compounds ~~of the general~~ formula (I)



(I)

~~in which~~ wherein

Q^1 represents O ~~(oxygen)~~ or S ~~(sulphur)~~,

Q^2 represents O ~~(oxygen)~~ or S ~~(sulphur)~~,

R^1 represents in each case optionally substituted alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl, heterocyclyl or heterocyclyl-alkyl,

R^2 represents hydrogen, cyano, nitro, halogen or represents in each case optionally substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkyl-sulphinyl, alkylsulphonyl, alkenyl, alkinyl, alkenyloxy or alkinyloxy,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, halogen or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylthio, alkylamino, alkylcarbonylamino, alkenyloxy, alkinyl-oxy, alkenylthio, alkinylthio, alkenylamino, alkinylamino, dialkylamino,

aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio, cycloalkylalkylamino, aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino, and

R^4 represents hydrogen, hydroxyl, amino, cyano, represents alkylideneamino or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylamino, alkyl-carbonylamino, alkenyloxy, dialkylamino, cycloalkyl, cycloalkylamino, cycloalkylalkyl, aryl or arylalkyl, or

R^3 and R^4 together represent optionally branched alkanediyl,

- ~~and~~ or one or more salts of the compounds of the formula (I)~~—~~.

2. (Once Amended) The ~~C~~compounds ~~characterized in that~~ wherein

Q^1 represents O ~~(oxygen)~~ or S ~~(sulphur)~~,

Q^2 represents O ~~(oxygen)~~ or S ~~(sulphur)~~,

R^1 represents optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally cyano- or halogen-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally cyano-, halogen- or C_1-C_4-alkyl-substituted cycloalkyl or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the cycloalkyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each

optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted heterocyclyl or heterocyclylalkyl having in each case up to 6 carbon atoms and additionally 1 to 4 nitrogen atoms and/or 1 to 2 oxygen or sulphur atoms in the heterocyclyl group and optionally 1 to 4 carbon atoms in the alkyl moiety,

R^2 represents hydrogen, cyano, nitro, halogen, represents in each case optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkylsulphinyl or alkylsulphonyl having in each case 1 to 6 carbon atoms in the alkyl group, or represents in each case optionally cyano- or halogen-substituted alkenyl, alkinyl, alkenyloxy or alkinyloxy having in each case 2 to 6 carbon atoms in the alkenyl or alkinyl group,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, iodine, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-substituted alkoxy, alkylthio, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy, alkinyloxy, alkenylthio, alkinylthio, alkenylamino or alkinylamino having in each case 3 to 6 carbon atoms in the alkenyl or alkinyl group, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally methyl- and/or ethyl-substituted aziridino, pyrrolidino, piperidino or morpholino, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl,

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cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkyl-alkyl, cycloalkylalkoxy, cycloalkylalkylthio or cycloalkylalkylamino having in each case 3 to 6 carbon atoms in the cycloalkyl or cycloalkenyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl-, C_1-C_4-alkoxy- and/or C_1-C_4-alkoxy-carbonyl-substituted aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, and

R^4 represents hydrogen, hydroxyl, amino, cyano, represents C_2-C_{10}-alkylideneamino, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-substituted alkoxy, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy having 3 to 6 carbon atoms, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl, cycloalkyl-amino or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the alkyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl- and/or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or

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R^3 and R^4 together represent optionally branched alkanediyl having 3 to 6 carbon atoms,

and ~~the~~ a sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salt~~s~~ of ~~these~~ said compound~~s~~ of the formula (I).

3. (Once Amended) The c~~C~~ompound~~s~~ according to Claim 1 ~~or 2, characterized in that~~ wherein

Q^1 represents O ~~(oxygen)~~ or S ~~(sulphur)~~,

Q^2 represents O ~~(oxygen)~~ or S ~~(sulphur)~~,

R^1 represents in each case optionally cyano-, fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl or butinyl, represents in each case optionally cyano-, fluorine-, chlorine-, methyl- or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, trifluoromethyl-, methoxy-, ethoxy-, n- or i-propoxy-, difluoromethoxy- or trifluoromethoxy-substituted phenyl, phenylmethyl or phenylethyl, or represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, methoxy-, ethoxy-, n- or i-propoxy-substituted heterocyclyl or hetero-cyclylmethyl, where the heterocyclyl group is in each case selected

Date Recue/Date Received 2020-09-08

from the group consisting of oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl, tetrahydrothienyl,

R^2 represents hydrogen, cyano, fluorine, chlorine, bromine, represents in each case optionally cyano-, fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, methoxy, ethoxy, n- or i-propoxy, methoxycarbonyl, ethoxycarbonyl, n- or i-propoxycarbonyl, methylthio, ethylthio, n- or i-propylthio, methylsulphinyl, ethylsulphinyl, methylsulphonyl or ethylsulphonyl, or represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl, butinyl, propenyloxy, butenyloxy, propinyloxy or butinyloxy,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy, acetyl-, propionyl-, n- or i-butyroyl-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, ethinyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, acetylamino or propionylamino, represents propenyloxy, butenyloxy, ethinyloxy, propinyloxy, butinyloxy, propenylthio, butenylthio, propinylthio, butinylthio, propenylamino, butenylamino, propinylamino or butinylamino, represents dimethylamino, diethylamino or dipropylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl,

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cyclohexyl, cyclopentenyl, cyclohexenyl, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, cyclopropylthio, cyclobutylthio, cyclopentylthio, cyclohexylthio, cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclopropylmethoxy, cyclobutylmethoxy, cyclopentylmethoxy, cyclohexylmethoxy, cyclopropylmethylthio, cyclobutylmethylthio, cyclopentylmethylthio, cyclohexylmethylthio, cyclopropylmethylamino, cyclobutylmethylamino, cyclopentylmethylamino or cyclohexylmethylamino, or represents in each case optionally fluorine-, chlorine-, bromine-, methyl-, trifluoromethyl-, methoxy- or methoxy-carbonyl-substituted phenyl, benzyl, phenoxy, benzyloxy, phenylthio, benzylthio, phenylamino or benzylamino, and

R^4 represents hydrogen, hydroxyl, amino, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy or butenyloxy, represents dimethylamino or diethylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, or represents in each case optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted phenyl or benzyl, or

R^3 and R^4 together represent trimethylene (propane-1,3-diyl), tetramethylene (butane-1,4-diyl) or pentamethylene (pentane-1,5-diyl),

and ~~the~~ a sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salt~~s~~ of ~~these~~ said compound~~s~~.

4. (Once Amended) A ~~C~~compound~~s~~ according to ~~any one of~~ Claim~~s~~ 1 ~~to 3, characterized in that~~wherein

Q^1 represents O ~~(oxygen)~~,

Q^2 represents O ~~(oxygen)~~,

R^1 represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl,

R^2 represents fluorine, chlorine, bromine or represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl,

R^3 represents hydrogen, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case optionally fluorine- or chlorine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methoxy, ethoxy, n- or i-propoxy, methylthio, ethylthio, n- or i-propylthio, methyl-amino, ethylamino, n- or i-propylamino, represents propenyloxy, propinyloxy, propenylthio, propinylthio, propenylamino or propinyl-amino, represents dimethylamino or diethylamino, represents in each

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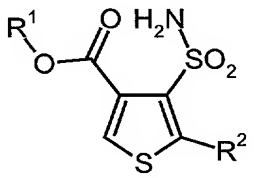
case optionally fluorine-, chlorine- or methyl-substituted cyclopropyl, cyclopropyloxy, cyclopropylmethyl or cyclopropylmethoxy, and

R^4 represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case optionally fluorine- or chlorine-substituted ethenyl, propenyl or propinyl, represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, represents methylamino, or represents cyclopropyl,

and ~~the~~ a sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkylammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkylammonium and di-(C_1-C_2-alkyl)-benzylammonium salt~~s~~ of ~~these~~ said compound~~s~~.

5. (Once Amended) A ~~P~~process for preparing a compound~~s~~ according to ~~any of~~ Claim~~s~~ 1 ~~to 4, characterized in that~~, said process being selected from the group consisting of process (a), process (b), process (c), process (d) and process (e), wherein

(a) said process (a) comprises the step of reacting a substituted thiophene-3-sulphonamide~~s~~ of the ~~general~~ formula (II)

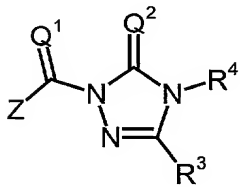


(II)

~~in which~~wherein

R^1 and R^2 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~

~~are reacted~~ with a substituted triazolin(ethi)one~~s~~ of the ~~general~~ formula (III)



(III)

~~in which~~wherein

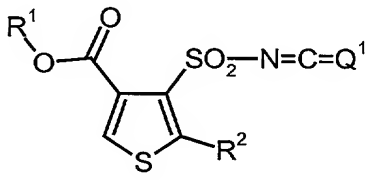
Q^1, Q^2, R^3 and R^4 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~ and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

~~if appropriate~~ optionally in the presence of a reaction auxiliary and ~~if appropriate~~ optionally in the presence of a diluent,

~~or that~~

(b) said process (b) comprises the step of reacting a substituted thien-3-yl-sulphonyl iso(thio)cyanate~~s~~ of the ~~general~~ formula (IV)

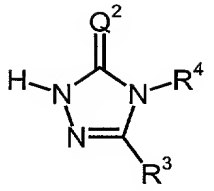


(IV)

~~in which~~wherein

Q^1, R^1 and R^2 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~,

~~are reacted~~ with a triazolin(ethi)one~~s~~ of the ~~general~~ formula (V)



(V)

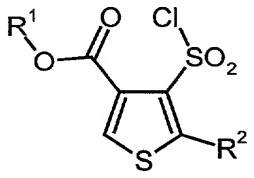
~~in which~~wherein

Q^2, R^4 and R^5 are each as defined in ~~any of~~ Claims 1 ~~to 4~~,

~~if appropriate~~ optionally in the presence of a reaction auxiliary and ~~if appropriate~~ optionally in the presence of a diluent,

~~or that~~

(c) said process (c) comprises the step of reacting a substituted thiophene-3-sulphonyl chlorides ~~of the general~~ formula (VI)

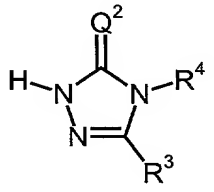


(VI)

~~in which~~wherein

R^1 and R^2 are each as defined in ~~any of~~ Claims 1 ~~to 4~~,

~~are reacted~~ with a triazolin(ethi)ones ~~of the general~~ formula (V)



(V)

~~in which~~wherein

Q^2, R^4 and R^5 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~

and a metal (thio)cyanate~~s~~ of the ~~general~~ formula (VII)

$$M\text{-}Q^1\text{-}CN \qquad (VII)$$

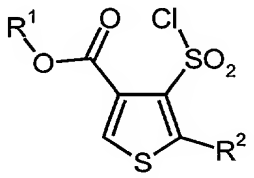
~~in which~~wherein

Q^1 is as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~,

~~if appropriate~~ optionally in the presence of a reaction auxiliary and ~~if appropriate~~ optionally in the presence of a diluent,

~~or that~~

(d) said process (d) comprises the step of reacting a substituted thiophene-3-sulphonyl chloride~~s~~ of the ~~general~~ formula (VI)

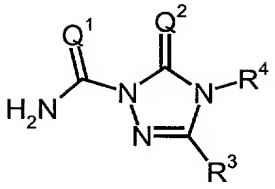


(VI)

~~in which~~wherein

R^1 and R^2 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~

~~are reacted~~ with a triazolin(ethi)one-(thio)carboxamide~~s~~ of the ~~general~~ formula (VIII)



(VIII)

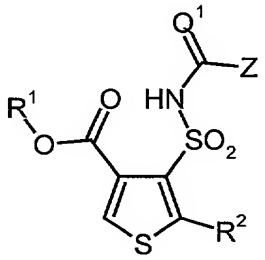
~~in which~~wherein

Q^1, Q^2, R^3 and R^4 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to~~ 4,

~~if appropriate~~optionally in the presence of a reaction auxiliary and ~~if appropriate~~ optionally in the presence of a diluent,

~~or that~~ and

(e) said process (e) comprises the step of reacting a substituted thien-3-yl-sulphonylamino(thio)carbonyl compound~~s~~ of the ~~general~~ formula (IX)



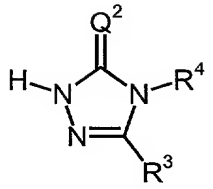
(IX)

~~in which~~wherein

Q^1, R^1 and R^2 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to~~ 4 and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

~~are reacted~~ with a triazolin(ethi)one~~s~~ of the ~~general~~ formula (V)



(V)

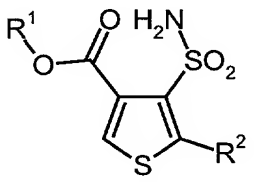
~~in which~~wherein

Q^2, R^4 and R^5 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~,

~~if appropriate~~ optionally in the presence of a reaction auxiliary and ~~if appropriate~~ optionally in the presence of a diluent,

~~and~~ wherein each of said processes (a), (b), (c), (d) and (e) further optionally comprises the step of converting the compound~~s~~ of the formula (I) obtained by ~~the~~ said processes (a), (b), (c), (d) and~~or~~ (e) ~~are~~, ~~if appropriate, converted by customary methods~~ into a salt~~s~~.

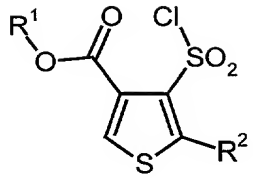
6. (Once Amended) A ~~C~~compound~~s~~ of the ~~general~~ formula (II)



(II)

~~in which~~wherein R^1 and R^2 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~, ~~except for the~~ excluding the compound 4-methoxycarbonyl-thiophene-3-sulphonamide.

7. (Once Amended) A ~~C~~compound~~s~~ of the ~~general~~ formula (VI)



(VI)

~~in which~~ wherein R^1 and R^2 are each as defined in ~~any of~~ Claim~~s~~ 1 ~~to 4~~, ~~except for~~ excluding the compound 4-methoxycarbonyl-thiophene-3-sulphonyl chloride.

8. (Once Amended) A ~~M~~method for controlling undesirable vegetation, ~~characterized in that at least~~ comprising the step of allowing one or more compound~~s~~ according to ~~any of~~ Claim~~s~~ 1 ~~to 4 is allowed~~ to act on a member selected from the group consisting of an undesirable plant~~s~~, ~~and/or their~~ a habitat of said undesirable plant and combinations thereof.

10. (Once Amended)— An ~~H~~herbicidal composition~~s, characterized in that they comprise~~ comprising ~~a~~ one or more compound~~s~~ according to ~~any of~~ Claim~~s~~ 1 ~~to 4~~ and ~~customary~~ a member selected from the group consisting of one or more extenders, ~~and/or~~ one or more surfactants, and combinations thereof.

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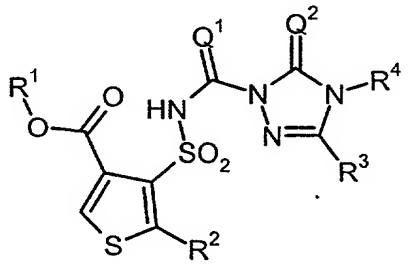
Substituted thien-3-yl-sulphonylamino(thio)carbonyl-triazolin(ethi)ones

The invention relates to novel substituted thien-3-yl-sulphonylamino(thio)carbonyl-triazolin(ethi)ones, to processes and novel intermediates for their preparation and to their use as herbicides.

It is already known that certain substituted thienylsulphonylamino(thio)carbonyl-triazolin(ethi)ones have herbicidal properties (cf. WO-A-97/16449, WO-A-98/24787). However, the activity of these compounds is not entirely satisfactory.

This invention, accordingly, provides the novel substituted thien-3-yl-sulphonylamino(thio)carbonyl-triazolin(ethi)ones of the general formula (I)



(I)

in which

Q^1 represents O (oxygen) or S (sulphur),

Q^2 represents O (oxygen) or S (sulphur),

R^1 represents in each case optionally substituted alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl, heterocyclyl or heterocyclylalkyl,

R^2 represents hydrogen, cyano, nitro, halogen or represents in each case optionally substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkylsulphinyl, alkylsulphonyl, alkenyl, alkinyl, alkenyloxy or alkinyloxy,

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Donna J. Veatch
(Name of person mailing paper or fee)
(Signature of person mailing paper or fee)

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, halogen or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylthio, alkylamino, alkylcarbonylamino, alkenyloxy, alkinyloxy, alkenylthio, alkinylthio, alkenylamino, alkinylamino, dialkylamino, aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio, cycloalkylalkylamino, aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino, and

R^4 represents hydrogen, hydroxyl, amino, cyano, represents alkylideneamino or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylamino, alkyl-carbonylamino, alkenyloxy, dialkylamino, cycloalkyl, cycloalkylamino, cycloalkylalkyl, aryl or arylalkyl, or

R^3 and R^4 together represent optionally branched alkanediyl,

- and salts of the compounds of the formula (I) - .

Saturated or unsaturated hydrocarbon groupings, such as alkyl, alkanediyl, alkenyl or alkinyl, are in each case straight-chain or branched as far as this is possible – including in combination with heteroatoms, such as in alkoxy.

Optionally substituted radicals can be mono- or polysubstituted, where, in the case of polysubstitution, the substituents can be identical or different.

Preferred substituents or ranges of the radicals present in the formulae given above and below are defined below.

Q^1 preferably represents O (oxygen) or S (sulphur).

Q^2 preferably represents O (oxygen) or S (sulphur).

R^1 preferably represents optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally cyano- or halogen-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally cyano-, halogen- or C_1-C_4-alkyl-substituted cycloalkyl or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the cycloalkyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted heterocyclyl or heterocyclylalkyl having in each case up to 6 carbon atoms and additionally 1 to 4 nitrogen atoms and/or 1 to 2 oxygen or sulphur atoms in the heterocyclyl group and optionally 1 to 4 carbon atoms in the alkyl moiety.

R^2 preferably represents hydrogen, cyano, nitro, halogen, represents in each case optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkylsulphinyl or alkylsulphonyl having in each case 1 to 6 carbon atoms in the alkyl group, or represents in each case optionally cyano- or halogen-substituted alkenyl, alkinyl, alkenyloxy or alkinyloxy having in each case 2 to 6 carbon atoms in the alkenyl or alkinyl group.

R^3 preferably represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, iodine, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-sub-

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stituted alkoxy, alkylthio, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy, alkinyloxy, alkenylthio, alkinylthio, alkenylamino or alkinylamino having in each case 3 to 6 carbon atoms in the alkenyl or alkinyl group, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally methyl- and/or ethyl-substituted aziridino, pyrrolidino, piperidino or morpholino, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio or cycloalkylalkylamino having in each case 3 to 6 carbon atoms in the cycloalkyl or cycloalkenyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl-, C_1-C_4-alkoxy- and/or C_1-C_4-alkoxy-carbonyl-substituted aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety.

R^4 preferably represents hydrogen, hydroxyl, amino, cyano, represents C_2-C_{10}-alkylideneamino, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-substituted alkoxy, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy having 3 to 6 carbon atoms, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl, cycloalkylamino or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the alkyl group and

optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl- and/or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety.

R^3 and R^4 together also preferably represent optionally branched alkanediyl having 3 to 6 carbon atoms.

Q^1 particularly preferably represents O (oxygen) or S (sulphur).

Q^2 particularly preferably represents O (oxygen) or S (sulphur).

R^1 particularly preferably represents in each case optionally cyano-, fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl or butinyl, represents in each case optionally cyano-, fluorine-, chlorine-, methyl- or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, trifluoromethyl-, methoxy-, ethoxy-, n- or i-propoxy-, difluoromethoxy- or trifluoromethoxy-substituted phenyl, phenylmethyl or phenylethyl, or represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, methoxy-, ethoxy-, n- or i-propoxy-substituted heterocyclyl or heterocyclylmethyl, where the heterocyclyl group is in each case selected from the group consisting of oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl, tetrahydrothienyl.

R^2 particularly preferably represents hydrogen, cyano, fluorine, chlorine, bromine, represents in each case optionally cyano-, fluorine-, chlorine-,

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methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, methoxy, ethoxy, n- or i-propoxy, methoxycarbonyl, ethoxycarbonyl, n- or i-propoxycarbonyl, methylthio, ethylthio, n- or i-propylthio, methylsulphinyl, ethylsulphinyl, methylsulphonyl or ethylsulphonyl, or represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl, butinyl, propenyloxy, butenyloxy, propinyloxy or butinyloxy.

R^3 particularly preferably represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy, acetyl-, propionyl-, n- or i-butyroyl-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, ethinyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, acetylamino or propionylamino, represents propenyloxy, butenyloxy, ethinyloxy, propinyloxy, butinyloxy, propenylthio, butenylthio, propinylthio, butinylthio, propenylamino, butenylamino, propinylamino or butinylamino, represents dimethylamino, diethylamino or dipropylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopentenyl, cyclohexenyl, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, cyclopropylthio, cyclobutylthio, cyclopentylthio, cyclohexylthio, cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclopropylmethoxy, cyclobutylmethoxy, cyclopentylmethoxy, cyclohexylmethoxy, cyclopropylmethylthio, cyclobutyl-

methylthio, cyclopentylmethylthio, cyclohexylmethylthio, cyclopropylmethylamino, cyclobutylmethylamino, cyclopentylmethylamino or cyclohexylmethylamino, or represents in each case optionally fluorine-, chlorine-, bromine-, methyl-, trifluoromethyl-, methoxy- or methoxy-carbonyl-substituted phenyl, benzyl, phenoxy, benzyloxy, phenylthio, benzylthio, phenylamino or benzylamino.

R^4 particularly preferably represents hydrogen, hydroxyl, amino, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy or butenyloxy, represents dimethylamino or diethylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, or represents in each case optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted phenyl or benzyl.

R^3 and R^4 together also particularly preferably represent trimethylene (propan-1,3-diyl), tetramethylene (butan-1,4-diyl) or pentamethylene (pentane-1,5-diyl).

Q^1 very particularly preferably represents O (oxygen).

Q^2 very particularly preferably represents O (oxygen).

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R^1 very particularly preferably represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl.

R^2 very particularly preferably represents fluorine, chlorine, bromine or represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl.

R^3 very particularly preferably represents hydrogen, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case optionally fluorine- or chlorine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methoxy, ethoxy, n- or i-propoxy, methylthio, ethylthio, n- or i-propylthio, methylamino, ethylamino, n- or i-propylamino, represents propenyloxy, propinyloxy, propenylthio, propinylthio, propenylamino or propinylamino, represents dimethylamino or diethylamino, represents in each case optionally fluorine-, chlorine- or methyl-substituted cyclopropyl, cyclopropyloxy, cyclopropylmethyl or cyclopropylmethoxy.

R^4 very particularly preferably represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case optionally fluorine- or chlorine-substituted ethenyl, propenyl or propinyl, represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, represents methylamino, or represents cyclopropyl.

R^1 most preferably represents methyl, ethyl, n- or i-propyl.

R^2 most preferably represents methyl, ethyl, n- or i-propyl.

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R^3 most preferably represents methoxy, ethoxy, n- or i-propoxy, methyl, ethyl, n- or i-propyl, methylthio, ethylthio, n- or i-propylthio or cyclopropyl.

R^4 most preferably represents methyl, ethyl, n- or i-propyl or cyclopropyl.

The invention also preferably provides the sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium-, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzyl-ammonium salts of compounds of the formula (I) in which Q^1, Q^2, R^1, R^2, R^3 and R^4 each preferably have the meanings given above.

The abovementioned general or preferred radical definitions apply both to the end products of the formula (I) and, correspondingly, to the starting materials or intermediates required in each case for the preparation. These radical definitions can be combined with one another as desired, i.e. including combinations between the given preferred ranges.

Preference according to the invention is given to those compounds of the formula (I) which contain a combination of the meanings listed above as being preferred.

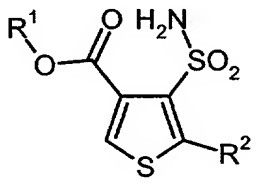
Particular preference according to the invention is given to those compounds of the formula (I) which contain a combination of the meanings listed above as being particularly preferred.

Very particular preference according to the invention is given to those compounds of the formula (I) which contain a combination of the meanings listed above as being very particularly preferred.

The novel substituted thien-3-yl-sulphonylamino(thio)carbonyl-triazolin(ethi)ones of the general formula (I) have interesting biological properties. In particular, they have strong herbicidal activity.

The novel substituted thien-3-yl-sulphonylamino(thio)carbonyl-triazolin(ethi)ones of the general formula (I) are obtained when

(a) substituted thiophene-3-sulphonamides of the general formula (II)

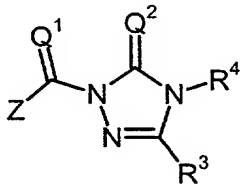


(II)

in which

R^1 and R^2 are each as defined above,

are reacted with substituted triazolin(ethi)ones of the general formula (III)



(III)

in which

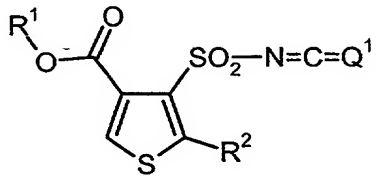
Q^1, Q^2, R^3 and R^4 are each as defined above and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or when

(b) substituted thien-3-yl-sulphonyl iso(thio)cyanates of the general formula (IV)

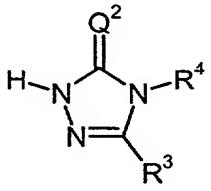


(IV)

in which

Q^1, R^1 and R^2 are each as defined above,

are reacted with triazolin(ethi)ones of the general formula (V)



(V)

in which

Q^2, R^4 and R^5 are each as defined above,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or when

(c) substituted thiophene-3-sulphonyl chlorides of the general formula (VI)

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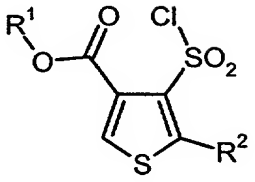
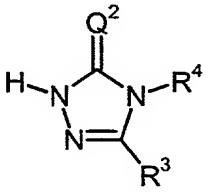


(VI)

in which

R^1 and R^2 are each as defined above,

are reacted with triazolin(ethi)ones of the general formula (V)



(V)

in which

Q^2, R^4 and R^5 are each as defined above,

and metal (thio)cyanates of the general formula (VII)

$$M\text{-}Q^1\text{-}CN \qquad \text{(VII)}$$

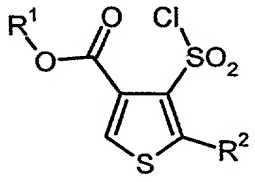
in which

Q^1 is as defined above,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or when

(d) substituted thiophene-3-sulphonyl chlorides of the general formula (VI)

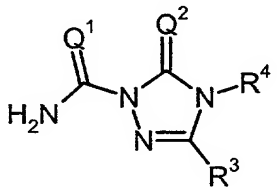


(VI)

in which

R^1 and R^2 are each as defined above,

are reacted with triazolin(ethi)one-(thio)carboxamides of the general formula (VIII)



(VIII)

in which

Q^1, Q^2, R^3 and R^4 are each as defined above,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or when

(e) substituted thien-3-yl-sulphonylamino(thio)carbonyl compounds of the general formula (IX)

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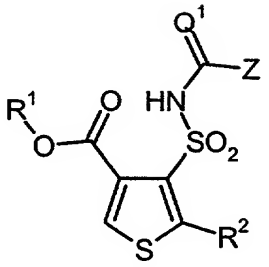


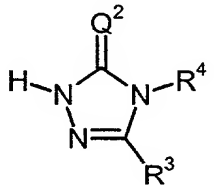
(IX)

in which

Q^1, R^1 and R^2 are each as defined above and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

are reacted with triazolin(ethi)ones of the general formula (V)



(V)

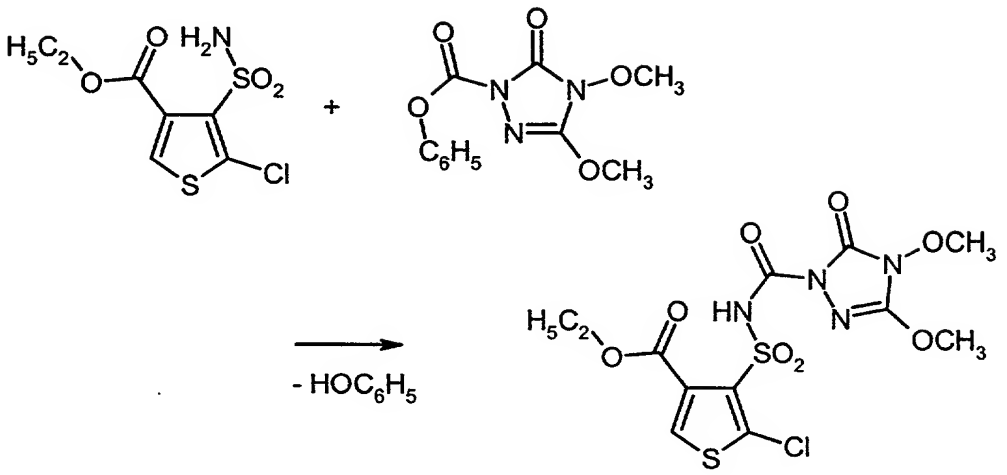
in which

Q^2, R^4 and R^5 are each as defined above,

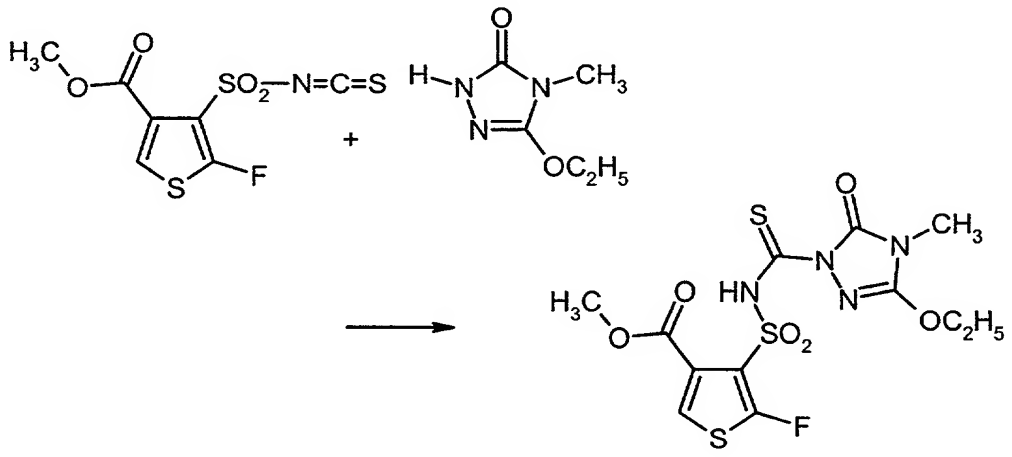
if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

and the compounds of the formula (I) obtained by the processes (a), (b), (c), (d) or (e) are, if appropriate, converted by customary methods into salts.

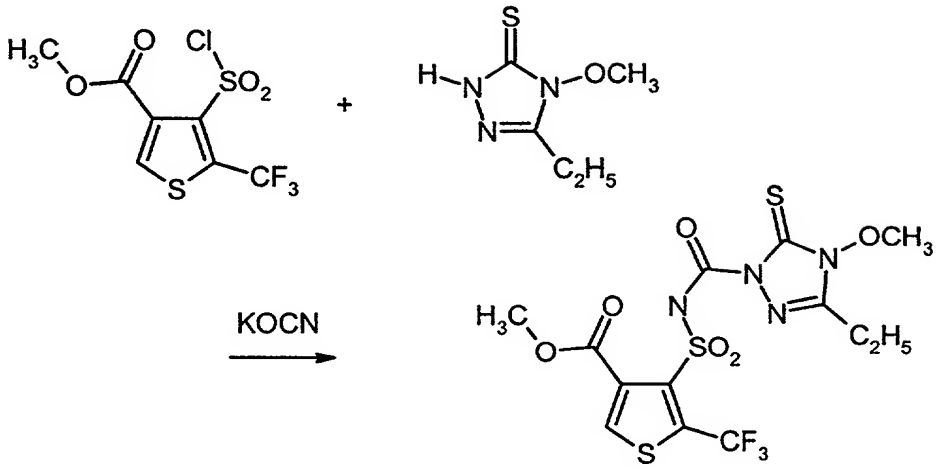
Using, for example, 2-chloro-4-ethoxycarbonyl-thiophene-3-sulphonamide and 4,5-dimethoxy-2-phenoxycarbonyl-2,4-dihydro-3H-1,2,4-triazol-3-one as starting materials, the course of the reaction in the process (a) according to the invention can be illustrated by the following formula scheme:



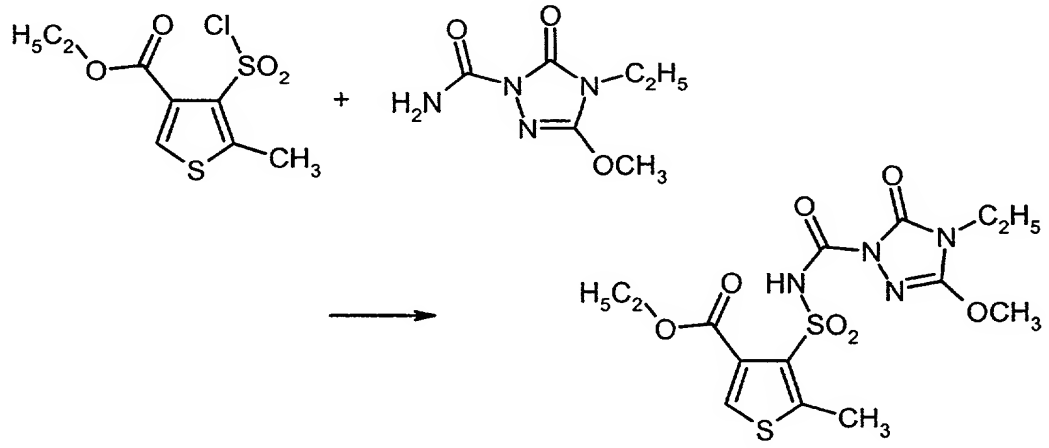
Using, for example, 2-fluoro-4-methoxycarbonyl-thien-3-yl-sulphonyl isothiocyanate and 5-ethoxy-4-methyl-2,4-dihydro-3H-1,2,4-triazol-3-one as starting materials, the course of the reaction in the process (b) according to the invention can be illustrated by the following formula scheme:



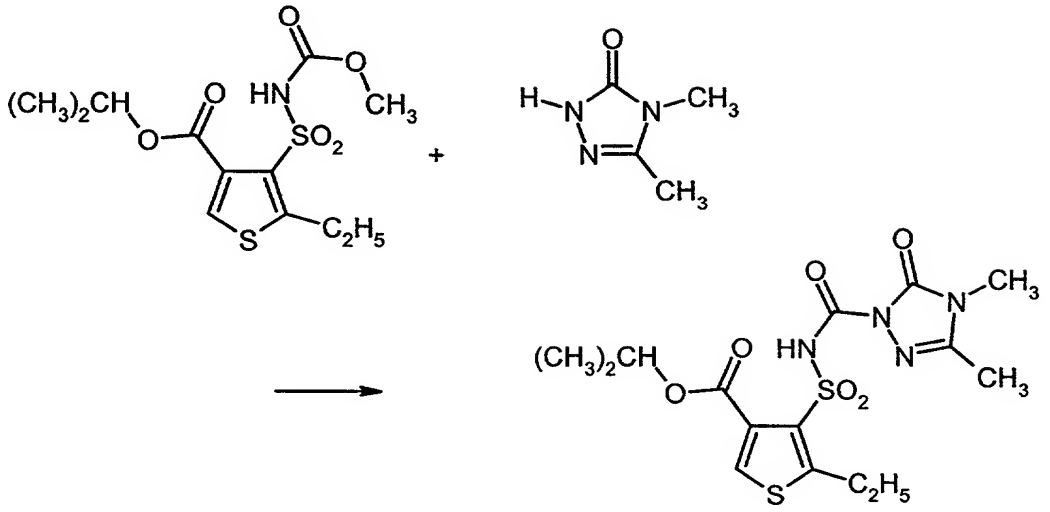
Using, for example, 4-methoxycarbonyl-2-trifluoromethyl-thiophene-3-sulphonyl chloride, 5-ethyl-4-methoxy-2,4-dihydro-3H-1,2,4-triazol-3-thione and potassium cyanate as starting materials, the course of the reaction in the process (c) according to the invention can be illustrated by the following formula scheme:



Using, for example, 3-ethoxycarbonyl-2-methyl-thiophene-4-sulphonyl chloride and 4-ethyl-5-methoxy-2,4-dihydro-3H-1,2,4-triazol-3-one-2-carboxamide as starting materials, the course of the reaction in the process (d) according to the invention can be illustrated by the following formula scheme:



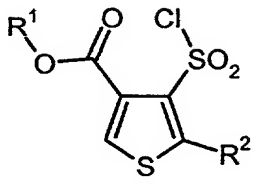
Using, for example, O-methyl N-(2-ethyl-4-i-propoxycarbonyl-thien-3-yl-sulphonyl)-urethane and 4,5-dimethyl-2,4-dihydro-3H-1,2,4-triazol-3-one as starting materials, the course of the reaction in the process (e) according to the invention can be illustrated by the following formula scheme:



The formula (II) provides a general definition of the substituted thiophene-3-sulphonamides to be used as starting materials in the process (a) according to the invention for preparing compounds of the general formula (I). In the general formula (II), R^1 and R^2 each preferably have those meanings which have already been mentioned above, in connection with the description of the compounds of the general formula (I) according to the invention, as being preferred, or those which have been mentioned in one of the particularly preferred definitions for R^1 and R^2.

Except for 4-methoxycarbonyl-thiophene-3-sulphonamide (cf. J. Org. Chem. 45 (1980), 617-620), the substituted thiophene-3-sulphonamides of the general formula (II) have hitherto not been disclosed in the literature; except for 4-methoxycarbonyl-thiophene-3-sulphonamide, they also form, as novel substances, part of the subject-matter of the present application.

The substituted thiophene-3-sulphonamides of the general formula (II) are obtained when substituted thiophene-3-sulphonyl chlorides of the general formula (VI)



(VI)

in which

R^1 and R^2 are each as defined above,

are reacted with ammonia or ammonium salts, such as, for example, ammonium acetate or ammonium carbonate, if appropriate in the presence of a diluent, such as, for example, water or methylene chloride, at temperatures between 0°C and 100°C (cf. the Preparation Examples).

The formula (III) provides a general definition of the substituted triazolin(ethi)ones furthermore to be used as starting materials in the process (a) according to the invention for preparing compounds of the general formula (I). In the general formula (III), Q^1, Q^2, R^3 and R^4 each preferably have those meanings which have already been mentioned above, in connection with the description of the compounds of the general formula (I) according to the invention, as being preferred, or those which have been mentioned in one of the particularly preferred definitions for Q^1, Q^2, R^3 and R^4.

The starting materials of the general formula (III) are known and/or can be prepared by processes known per se (cf. EP-A-341 489, EP-A-422 469, EP-A-425 948, EP-A-431 291, EP-A-507 171, EP-A-534 266).

The formula (IV) provides a general definition of the substituted thien-3-yl-sulphonyl iso(thio)cyanates to be used as starting materials in the process (b) according to the invention for preparing compounds of the general formula (I). In the general formula (IV), Q^1, R^1 and R^2 each preferably have those meanings which have already been mentioned above, in connection with the description of the compounds of the general

formula (I) according to the invention, as being preferred, or those which have been mentioned in one of the particularly preferred definitions for Q^1, R^1 and R^2.

The starting materials of the general formula (IV) are known and/or can be prepared by processes known per se (cf. US-A-47 01 535).

The formula (V) provides a general definition of the triazolin(ethi)ones to be used as starting materials in the processes (b), (c) and (e) according to the invention for preparing compounds of the general formula (I). In the general formula (V), Q^2, R^4 and R^5 each preferably have those meanings which have already been mentioned above, in connection with the description of the compounds of the general formula (I) according to the invention, as being preferred, or those which have been mentioned in one of the particularly preferred definitions of Q^2, R^4 and R^5.

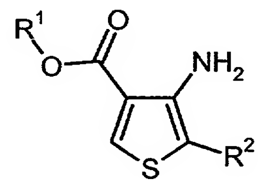
The starting materials of the general formula (V) are known and/or can be prepared by processes known per se (cf. EP-A-341 489, EP-A-422 469, EP-A-425 948, EP-A-431 291, EP-A-507 171, EP-A-534 266).

The formula (VI) provides a general definition of the substituted thiophene-3-sulphonyl chlorides to be used as starting materials in the processes (c) and (d) according to the invention for preparing compounds of the general formula (I). In the general formula (VI), R^1 and R^2 each preferably have those meanings which have already been mentioned above, in connection with the description of the compounds of the general formula (I) according to the invention, as being preferred, or those which have been mentioned in one of the particularly preferred definitions of R^1 and R^2.

Except for 4-methoxycarbonyl-thiophene-3-sulphonyl chloride (cf. J. Org. Chem. 45 (1980), 617-620), the substituted thiophene-3-sulphonyl chlorides of the general formula (VI) have hitherto not been disclosed in the literature; except for 4-methoxy-

carbonyl-thiophen-3-sulphonyl chloride, they also form, as novel substances, part of the subject-matter of the present application.

The substituted thiophene-3-sulphonyl chlorides of the general formula (VI) are obtained when 3-amino-thiophene-4-carboxylic esters of the general formula (X)



(X)

in which

R^1 and R^2 are each as defined above,

- or acid adducts of compounds of the formula (X), such as, for example, the hydrochlorides -

are reacted with an alkali metal nitrite, such as, for example, sodium nitrite, in the presence of hydrochloric acid at temperatures between –10°C and +10°C, and the resulting diazonium salt solution is reacted with sulphur dioxide in the presence of a diluent, such as, for example, dichloromethane, 1,2-dichloro-ethane or acetic acid, and in the presence of a catalyst, such as, for example, copper(I) chloride and/or copper(II) chloride, at temperatures between –10°C and +50°C.

The intermediates of the general formula (X) are known and/or can be prepared by processes known per se (cf. Austr. J. Chem. 48 (1995), 1907-1916; Preparation Examples).

The formula (VIII) provides a general definition of the triazolin(ethi)one-(thio)-carboxamides to be used as starting materials in the process (d) according to the invention for preparing compounds of the general formula (I). In the general formula (VIII), Q^1, Q^2, R^3 and R^4 each preferably have those meanings which have already

been mentioned above, in connection with the description of the compounds of the general formula (I) according to the invention, as being preferred, or those which have been mentioned in one of the particularly preferred definitions for Q^1, Q^2, R^3 and R^4.

The starting materials of the general formula (VIII) are known and/or can be prepared by processes known per se.

The formula (IX) provides a general definition of the substituted thien-3-yl-sulphonylamino(thio)carbonyl compounds to be used as starting materials in the process (e) according to the invention for preparing compounds of the general formula (I). In the general formula (IX), Q^1, R^1 and R^2 each preferably have those meanings which have already been mentioned above, in connection with the description of the compounds of the general formula (I) according to the invention, as being preferred, or those which have been mentioned in one of the particularly preferred definitions for Q^1, R^1 and R^2.

The starting materials of the general formula (IX) are known and/or can be prepared by processes known per se.

The processes (a), (b), (c), (d) and (e) according to the invention for preparing the novel compounds of the formula (I) are preferably carried out using diluents. Suitable diluents are virtually all inert organic solvents. These preferably include aliphatic and aromatic, optionally halogenated hydrocarbons, such as pentane, hexane, heptane, cyclohexane, petroleum ether, benzine, ligroin, benzene, toluene, xylene, methylene chloride, ethylene chloride, chloroform, carbon tetrachloride, chlorobenzene and o-dichlorobenzene, ethers such as diethyl ether and dibutyl ether, glycol dimethyl ether and diglycol dimethyl ether, tetrahydrofuran and dioxane, ketones, such as acetone, methyl ethyl ketone, methyl isopropyl ketone and methyl isobutyl ketone, esters, such as methyl acetate and ethyl acetate, nitriles, such as, for example, acetonitrile and propionitrile, amides, such as, for example, dimethylformamide,

dimethylacetamide and N-methylpyrrolidone, and also dimethyl sulphoxide, tetramethylene sulphone and hexamethyl phosphoric triamide.

Reaction auxiliaries suitable for the processes (a), (b), (c), (d) and (e) according to the invention are all acid binders which are customarily used for such reactions. Preference is given to alkali metal hydroxides, such as, for example, sodium hydroxide and potassium hydroxide, alkaline earth metal hydroxides, such as, for example, calcium hydroxide, alkali metal carbonates and alkoxides, such as sodium carbonate and potassium carbonate, sodium tert-butoxide and potassium tert-butoxide, furthermore basic nitrogen compounds, such as trimethylamine, triethylamine, tripropylamine, tributylamine, diisobutylamine, dicyclohexylamine, ethyldiisopropylamine, ethyldicyclohexylamine, N,N-dimethylbenzylamine, N,N-dimethyl-aniline, pyridine, 2-methyl-, 3-methyl-, 4-methyl-, 2,4-dimethyl-, 2,6-dimethyl-, 2-ethyl-, 4-ethyl- and 5-ethyl-2-methyl-pyridine, 1,5-diazabicyclo[4.3.0]-non-5-ene (DBN), 1,8-diazabicyclo-[5.4.0]-undec-7-ene (DBU) and 1,4-diazabicyclo[2.2.2]-octane (DABCO).

The reaction temperatures in the processes (a), (b), (c), (d) and (e) according to the invention can be varied within a relatively wide range. In general, the processes are carried out at temperatures between –20°C and +150°C, preferably at temperatures between 0°C and +100°C.

The processes (a), (b), (c), (d) and (e) according to the invention are generally carried out under atmospheric pressure. However, it is also possible to operate under elevated or reduced pressure.

For carrying out the processes (a), (b), (c), (d) and (e) according to the invention, the starting materials required in each case are generally employed in approximately equimolar amounts. However, it is also possible to use a relatively large excess of one of the components used in each case. The reactions are generally carried out in a suitable diluent in the presence of an acid acceptor, and the reaction mixture is stirred

for several hours at the temperature required in each case. Work-up in the processes (a), (b), (c), (d) and (e) according to the invention is in each case carried out by customary methods (cf. the Preparation Examples).

If appropriate, salts can be prepared from the compounds of the general formula (I) according to the invention. Such salts are obtained in a simple manner by customary methods for forming salts, for example by dissolving or dispersing a compound of the formula (I) in a suitable solvent, such as, for example, methylene chloride, acetone, tert-butyl methyl ether or toluene, and adding a suitable base. The salts can then – if appropriate after prolonged stirring – be isolated by concentration or filtration with suction.

The active compounds according to the invention can be used as defoliants, desiccants, haulm killers and, especially, as weedkillers. By weeds in the broadest sense, there are to be understood all plants which grow in locations where they are not wanted. Whether the substances according to the invention act as total or selective herbicides depends essentially on the amount used.

The active compounds according to the invention can be used, for example, in connection with the following plants:

Dicotyledonous weeds of the genera: Abutilon, Amaranthus, Ambrosia, Anoda, Anthemis, Aphanes, Atriplex, Bellis, Bidens, Capsella, Carduus, Cassia, Centaurea, Chenopodium, Cirsium, Convolvulus, Datura, Desmodium, Emex, Erysimum, Euphorbia, Galeopsis, Galinsoga, Galium, Hibiscus, Ipomoea, Kochia, Lamium, Lepidium, Lindernia, Matricaria, Mentha, Mercurialis, Mullugo, Myosotis, Papaver, Pharbitis, Plantago, Polygonum, Portulaca, Ranunculus, Raphanus, Rorippa, Rotala, Rumex, Salsola, Senecio, Sesbania, Sida, Sinapis, Solanum, Sonchus, Sphenoclea, Stellaria, Taraxacum, Thlaspi, Trifolium, Urtica, Veronica, Viola, Xanthium.

Dicotyledonous crops of the genera: Arachis, Beta, Brassica, Cucumis, Cucurbita, Helianthus, Daucus, Glycine, Gossypium, Ipomoea, Lactuca, Linum, Lycopersicon, Nicotiana, Phaseolus, Pisum, Solanum, Vicia.

Monocotyledonous weeds of the genera: Aegilops, Agropyron, Agrostis, Alopecurus, Apera, Avena, Brachiaria, Bromus, Cenchrus, Commelina, Cynodon, Cyperus, Dactyloctenium, Digitaria, Echinochloa, Eleocharis, Eleusine, Eragrostis, Eriochloa, Festuca, Fimbristylis, Heteranthera, Imperata, Ischaemum, Leptochloa, Lolium, Monochoria, Panicum, Paspalum, Phalaris, Phleum, Poa, Rottboellia, Sagittaria, Scirpus, Setaria, Sorghum.

Monocotyledonous crops of the genera: Allium, Ananas, Asparagus, Avena, Hordeum, Oryza, Panicum, Saccharum, Secale, Sorghum, Triticale, Triticum, Zea.

However, the use of the active compounds according to the invention is in no way restricted to these genera, but also extends in the same manner to other plants.

According to the invention, it is possible to treat all plants and parts of plants. By plants are understood here all plants and plant populations such as desired and undesired wild plants or crop plants (including naturally occurring crop plants). Crop plants can be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including transgenic plants and including plant varieties which may or may not be protectable by plant variety property rights. Parts of plants are to be understood as meaning all above-ground and below-ground parts and organs of plants, such as shoot, leaf, flower and root, examples which may be mentioned being leaves, needles, stems, trunks, flowers, shoot-bodies, fruits and seeds and also roots, and vegetative and generative propagation material, for example seedlings, tubers, rhizomes, cuttings and seeds.

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The treatment of the plants and parts of plants according to the invention with the active compounds is carried out directly or by action on their environment, habitat or storage area according to customary treatment methods, for example by dipping, spraying, evaporating, atomizing, broadcasting, brushing-on and, in the case of propagation materials, in particular in the case of seeds, furthermore by single- or multi-layer coating.

Depending on the concentration, the active compounds according to the invention are suitable for total weed control, for example on industrial sites and rail tracks and on paths and areas with or without tree growth. Equally, the compounds can be employed for controlling weeds in perennial crops, for example forests, ornamental tree plantings, orchards, vineyards, citrus groves, nut orchards, banana plantations, coffee plantations, tea plantations, rubber plantations, oil palm plantations, cocoa plantations, soft fruit plantings and hop fields, on lawns and turf and pastures and for selective weed control in annual crops.

The compounds of the formula (I) according to the invention have strong herbicidal activity and a broad activity spectrum when applied on the soil and on above-ground parts of plants. To a certain extent, they are also suitable for selective control of monocotyledonous and dicotyledonous weeds in monocotyledonous and dicotyledonous crops, both by the pre-emergence and by the post-emergence method.

The active compounds can be converted into the customary formulations, such as solutions, emulsions, wettable powders, suspensions, powders, dusts, pastes, soluble powders, granules, suspo-emulsion concentrates, natural and synthetic substances impregnated with active compound, and microencapsulations in polymeric substances.

These formulations are produced in a known manner, for example by mixing the active compounds with extenders, that is to say liquid solvents and/or solid carriers,

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optionally with the use of surfactants, that is to say emulsifiers and/or dispersants and/or foam formers.

If the extender used is water, it is also possible to use, for example, organic solvents as auxiliary solvents. Liquid solvents which are mainly suitable are: aromatics, such as xylene, toluene or alkylnaphthalenes, chlorinated aromatics and chlorinated aliphatic hydrocarbons, such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons, such as cyclohexane or paraffins, for example petroleum fractions, mineral and vegetable oils, alcohols, such as butanol or glycol, and also their ethers and esters, ketones, such as acetone, methyl ethyl ketone, methyl isobutyl ketone or cyclohexanone, strongly polar solvents, such as dimethylformamide and dimethyl sulphoxide, and water.

Suitable solid carriers are: for example ammonium salts and ground natural minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as finely divided silica, alumina and silicates; suitable solid carriers for granules are: for example crushed and fractionated natural rocks, such as calcite, marble, pumice, sepiolite, dolomite and synthetic granules of inorganic and organic meals, and granules of organic material, such as sawdust, coconut shells, maize cobs and tobacco stalks; suitable emulsifiers and/or foam formers are: for example nonionic and anionic emulsifiers, such as polyoxyethylene fatty acid esters, polyoxyethylene fatty alcohol ethers, for example alkylaryl polyglycol ethers, alkylsulphonates, alkyl sulphates, arylsulphonates and protein hydrolysates; suitable dispersants are: for example lignosulphite waste liquors and methylcellulose.

Tackifiers, such as carboxymethylcellulose, natural and synthetic polymers in the form of powders, granules or latices, such as gum arabic, polyvinyl alcohol and polyvinyl acetate, and also natural phospholipids, such as cephalins and lecithins, and synthetic phospholipids can be used in the formulations. Other possible additives are mineral and vegetable oils.

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It is possible to use dyestuffs, such as inorganic pigments, for example iron oxide, titanium oxide, Prussian blue, and organic dyestuffs, such as alizarin dyestuffs, azo dyestuffs and metal phthalocyanine dyestuffs, and trace nutrients, such as salts of iron, manganese, boron, copper, cobalt, molybdenum and zinc.

The formulations generally comprise between 0.1 and 95 per cent by weight of active compound, preferably between 0.5 and 90%.

For controlling weeds, the active compounds according to the invention, as such or in the form of their formulations, can also be used as mixtures with known herbicides, finished formulations or tank mixes being possible.

Possible components for the mixtures are known herbicides, for example

acetochlor, acifluorfen(-sodium), aclonifen, alachlor, alloxydim(-sodium), ametryne, amidochlor, amidosulfuron, anilofos, asulam, atrazine, azafenidin, azimsulfuron, benazolin(-ethyl), benfuresate, bensulfuron(-methyl), bentazone, benzobicyclon, benzofenap, benzoylprop(-ethyl), bialaphos, bifenox, bispyribac(-sodium), bromobutide, bromofenoxim, bromoxynil, butachlor, butroxydim, butylate, cafenstrole, caloxydim, carbetamide, carfentrazone(-ethyl), chlomethoxyfen, chloramben, chloridazon, chlorimuron(-ethyl), chlornitrofen, chlorsulfuron, chlorotoluron, cinidon(-ethyl), cinmethylin, cinosulfuron, clefoxydim, clethodim, clodinafop-(-propargyl), clomazone, clomeprop, clopyralid, clopyrasulfuron(-methyl), cloransulam(-methyl), cumyluron, cyanazine, cybutryne, cycloate, cyclosulfamuron, cycloxydim, cyhalofop(-butyl), 2,4-D, 2,4-DB, 2,4-DP, desmedipham, diallate, dicamba, diclofop(-methyl), diclosulam, diethatyl(-ethyl), difenzoquat, diflufenican, diflufenzopyr, dimefuron, dimepiperate, dimethachlor, dimethametryn, dimethenamid, dimexyflam, dinitramine, diphenamid, diquat, dithiopyr, diuron, dymron, epoprodan, EPTC, esprocarb, ethalfluralin, ethametsulfuron(-methyl), ethofumesate, ethoxyfen, ethoxysulfuron, etobenzanid, fenoxaprop-(-P-ethyl),

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fentrazamide, flamprop(-isopropyl), flamprop(-isopropyl-L), flamprop(-methyl), flazasulfuron, florasulam, fluazifop(-P-butyl), fluazolate, flucarbazone, flufenacet, flumetsulam, flumiclorac(-pentyl), flumioxazin, flumipropyn, flumetsulam, fluometuron, fluorochloridone, fluoroglycofen(-ethyl), flupoxam, flupropacil, flurpyrsulfuron(-methyl, -sodium), flurenol(-butyl), fluridone, fluroxypyr(-meptyl), flurprimidol, flurtamone, fluthiacet(-methyl), fluthiamide, fomesafen, glufosinate(-ammonium), glyphosate(-isopropylammonium), halosafen, haloxyfop(-ethoxyethyl), haloxyfop(-P-methyl), hexazinone, imazamethabenz-(-methyl), imazamethapyr, imazamox, imazapic, imazapyr, imazaquin, imazethapyr, imazosulfuron, iodosulfuron(-methyl, -sodium), ioxynil, isopropalin, isoproturon, isouron, isoxaben, isoxachlortole, isoxaflutole, isoxapyrifop, lactofen, lenacil, linuron, MCPA, MCPP, mefenacet, mesotrione, metamitron, metazachlor, methabenzthiazuron, metobenzuron, metobromuron, (alpha-)metolachlor, metosulam, metoxuron, metribuzin, metsulfuron(-methyl), molinate, monolinuron, naproanilide, napropamide, neburon, nicosulfuron, norflurazon, orbencarb, oryzalin, oxadiargyl, oxadiazon, oxasulfuron, oxaziclomefone, oxyfluorfen, paraquat, pelargonic acid, pendimethalin, pendralin, pentoxazone, phenmedipham, piperophos, pretilachlor, primisulfuron(-methyl), prometryn, propachlor, propanil, propaquizafop, propisochlor, propyzamide, prosulfocarb, prosulfuron, pyraflufen(-ethyl), pyrazolate, pyrazosulfuron(-ethyl), pyrazoxyfen, pyribenzoxim, pyributicarb, pyridate, pyriminobac(-methyl), pyrithiobac(-sodium), quinchlorac, quinmerac, quinoclamine, quizalofop(-P-ethyl), quizalofop(-P-tefuryl), rimsulfuron, sethoxydim, simazine, simetryn, sulcotrione, sulfentrazone, sulfometuron(-methyl), sulfosate, sulfosulfuron, tebutam, tebuthiuron, terbuthylazine, terbutryn, thenylchlor, thiafluamide, thiazopyr, thidiazimin, thifensulfuron(-methyl), thiobencarb, tiocarbazil, tralkoxydim, triallate, triasulfuron, tribenuron(-methyl), triclopyr, tridiphane, trifluralin and triflusulfuron.

A mixture with other known active compounds, such as fungicides, insecticides, acaricides, nematicides, bird repellents, plant nutrients and agents which improve soil structure, is also possible.

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The active compounds can be used as such, in the form of their formulations or in the use forms prepared therefrom by further dilution, such as ready-to-use solutions, suspensions, emulsions, powders, pastes and granules. They are used in the customary manner, for example by watering, spraying, atomizing, scattering.

The active compounds according to the invention can be applied both before and after emergence of the plants. They can also be incorporated into the soil before sowing.

The amount of active compound used can vary within a relatively wide range. It depends essentially on the nature of the desired effect. In general, the amounts used are between 1 g and 10 kg of active compound per hectare of soil surface, preferably between 5 g and 5 kg per ha.

The preparation and the use of the active compounds according to the invention can be seen from the examples below.

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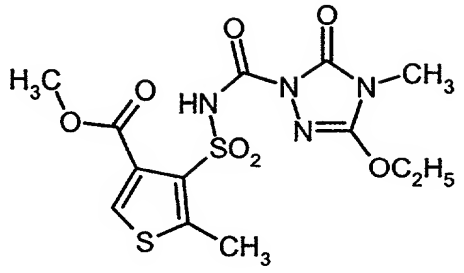
Preparation Examples:

Example 1

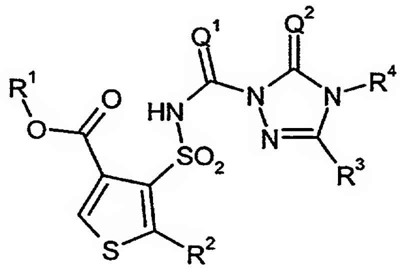


(Process (a))

0.76 g (2.9 mmol) of 5-ethoxy-4-methyl-2-phenoxycarbonyl-2,4-dihydro-3H-1,2,4-triazol-3-one are dissolved in 40 ml of acetonitrile and, at room temperature (about 20°C) admixed a little at a time and with stirring with 0.75 g (3.2 mmol) of 4-methoxycarbonyl-2-methyl-thiophene-3-sulphonamide and 0.49 g (3.2 mmol) of 1,8-diazabicyclo-[5.4.0]-undec-7-ene (DBU). The reaction mixture is stirred at room temperature for 12 hours and then concentrated under reduced pressure. The residue is taken up in methylene chloride, washed successively with 1 N hydrochloric acid and water, dried with sodium sulphate and filtered. The filtrate is concentrated under water pump vacuum, the residue is digested with isopropanol and the resulting crystalline product is isolated by filtration with suction.

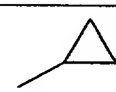
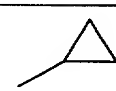
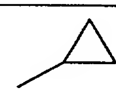
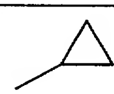
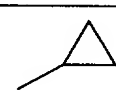
This gives 0.70 g (60% of theory) of methyl 4-[[[(3-ethoxy-4,5-dihydro-4-methyl-5-oxo-1H-1,2,4-triazol-1-yl)-carbonyl]-amino]-sulphonyl]-5-methyl-thiophene-3-carboxylate (alias 5-ethoxy-4-methyl-2-[(4-methoxycarbonyl-2-methyl-thien-3-yl)-sulphonyl-amino-carbonyl]-2,4-dihydro-3H-1,2,4-triazol-3-one) of melting point 163°C.

Analogously to Example 1, and in accordance with the general description of the preparation processes according to the invention, it is also possible to prepare, for example, the compounds of the general formula (I) listed in Table 1 below.



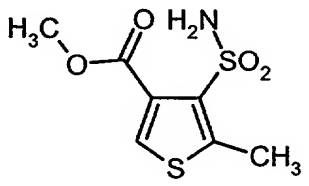
(I)

Table 1: Examples of compounds of the formula (I)

Ex. No.	Q^1	Q^2	R^1	R^2	R^3	R^4	Melting point (°C)
2	O	O	CH_3	CH_3	OCH_3	CH_3	201
3	O	O	CH_3	CH_3	OC_3H_7-n	CH_3	156
4	O	O	CH_3	CH_3	OC_3H_7-i	CH_3	150
5	O	O	CH_3	CH_3	OCH_3		218
6	O	O	CH_3	CH_3	OC_2H_5		170
7	O	O	CH_3	CH_3	OC_3H_7-n		156
8	O	O	CH_3	CH_3	OC_3H_7-i		188
9	O	O	CH_3	CH_3			200
10	O	O	CH_3	CH_3	CH_3	CH_3	178
11	O	O	CH_3	CH_3	C_2H_5	CH_3	161
12	O	O	CH_3	CH_3	SCH_3	CH_3	183

Starting materials of the formula (II):

Example (II-1)



A mixture of 45 g (177 mmol) of 4-methoxycarbonyl-2-methyl-thiophene-3-sulphonyl chloride, 34 g (354 mmol) of ammonium carbonate and 400 ml of methylene chloride is stirred at room temperature (about 20°C) for 12 hours. The mixture is filtered and the solvent is then distilled off from the filtrate under water pump vacuum, the residue is digested with diethyl ether and the crystalline product is isolated by filtration with suction. This gives 21.5 g (52% of theory) of 4-methoxy-carbonyl-2-methyl-thiophene-3-sulphonamide.

Analogously to Example (II-1), it is also possible to prepare, for example, the following compounds of the general formula (II):

4-ethoxycarbonyl-2-methyl-thiophene-3-sulphonamide,
4-n-propoxycarbonyl-2-methyl-thiophene-3-sulphonamide,
4-i-propoxycarbonyl-2-methyl-thiophene-3-sulphonamide,
4-methoxycarbonyl-2-ethyl-thiophene-3-sulphonamide,
4-ethoxycarbonyl-2-ethyl-thiophene-3-sulphonamide,
4-n-propoxycarbonyl-2-ethyl-thiophene-3-sulphonamide,
4-i-propoxycarbonyl-2-ethyl-thiophene-3-sulphonamide,
4-methoxycarbonyl-2-n-propyl-thiophene-3-sulphonamide,
4-ethoxycarbonyl-2-n-propyl-thiophene-3-sulphonamide,
4-n-propoxycarbonyl-2-n-propyl-thiophene-3-sulphonamide,
4-i-propoxycarbonyl-2-n-propyl-thiophene-3-sulphonamide,
4-methoxycarbonyl-2-i-propyl-thiophene-3-sulphonamide,

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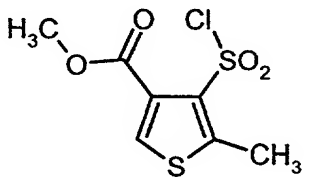
4-ethoxycarbonyl-2-i-propyl-thiophene-3-sulphonamide,

4-n-propoxycarbonyl-2-i-propyl-thiophene-3-sulphonamide,

4-i-propoxycarbonyl-2-i-propyl-thiophene-3-sulphonamide.

Starting materials of the formula (VI):

Example (VI-1)



At from 0°C to 5°C, a solution of 19.9 g (0.29 mol) of sodium nitrite in 60 ml of water is added dropwise with stirring to a solution of 42.7 g (0.25 mol) of methyl 3-amino-2-methyl-thiophene-4-carboxylate in 75 ml of 10% strength aqueous hydrochloric acid. The reaction mixture is stirred at from 0°C to 5°C for 60 minutes. The excess of nitride is then destroyed using amidosulphonic acid. At from 0°C to 5°C, the mixture is then added dropwise with stirring to a solution of 35 g (0.55 mol) of sulphur dioxide in 300 ml of methylene chloride. After addition of 1.5 g of copper(I) chloride and 1.5 g of dodecyl-trimethylammonium bromide, the reaction mixture is stirred at 40°C for 60 minutes and then at 20°C for 12 hours. 18 ml of 35% strength aqueous hydrochloric acid are then added, the mixture is stirred at 20°C for 4 hours and the phases are then separated. The aqueous phase is re-extracted with methylene chloride and the combined organic phases are washed with water, dried with magnesium sulphate and filtered. The filtrate is concentrated under water pump vacuum and the residue is crystallized from hexane.

This gives 51.7 g (81% of theory) of 4-methoxycarbonyl-2-methyl-thiophene-3-sulphonyl chloride.

Analogously to Example (VI-1), it is also possible to prepare, for example, the following compounds of the formula (VI):

4-ethoxycarbonyl-2-methyl-thiophene-3-sulphonyl chloride,
4-n-propoxycarbonyl-2-methyl-thiophene-3-sulphonyl chloride,
4-i-propoxycarbonyl-2-methyl-thiophene-3-sulphonyl chloride,
4-methoxycarbonyl-2-ethyl-thiophene-3-sulphonyl chloride,
4-ethoxycarbonyl-2-ethyl-thiophene-3-sulphonyl chloride,
4-n-propoxycarbonyl-2-ethyl-thiophene-3-sulphonyl chloride,
4-i-propoxycarbonyl-2-ethyl-thiophene-3-sulphonyl chloride,
4-methoxycarbonyl-2-n-propyl-thiophene-3-sulphonyl chloride,
4-ethoxycarbonyl-2-n-propyl-thiophene-3-sulphonyl chloride,
4-n-propoxycarbonyl-2-n-propyl-thiophene-3-sulphonyl chloride,
4-i-propoxycarbonyl-2-n-propyl-thiophene-3-sulphonyl chloride,
4-methoxycarbonyl-2-i-propyl-thiophene-3-sulphonyl chloride,
4-ethoxycarbonyl-2-i-propyl-thiophene-3-sulphonyl chloride,
4-n-propoxycarbonyl-2-i-propyl-thiophene-3-sulphonyl chloride,
4-i-propoxycarbonyl-2-i-propyl-thiophene-3-sulphonyl chloride.

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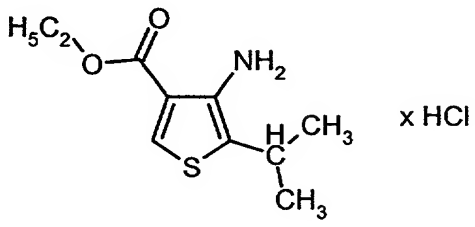
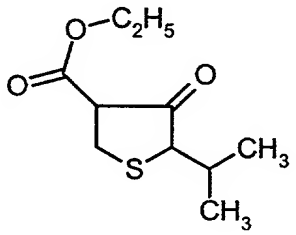
Starting materials of the formula (X):

Example (X-1)



x HCl

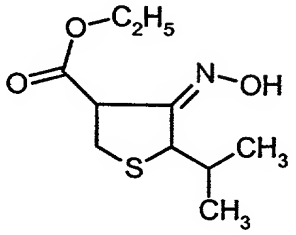
Step 1



Under water pump vacuum, 61 g of a 20% strength solution of sodium ethoxide in ethanol (213 mmol of $NaOCH_3$) are evaporated to dryness. The residue is taken up in 80 ml of toluene, and 28.6 g (109 mmol) of ethyl 2-(2-ethoxycarbonyl-ethylthio)-3-methyl-butyrate are then added and the reaction mixture is stirred at from 70°C to 80°C for 12 hours. After cooling to room temperature, the mixture is poured into ice-water and then acidified with conc. hydrochloric acid. The organic phase is then separated off, the aqueous phase is re-extracted with diethyl ether and the organic phases are combined, dried with magnesium sulphate and filtered. The filtrate is concentrated under water pump vacuum and the residue is purified by distillation under reduced pressure.

This gives 22.6 g (96% of theory) of ethyl 5-i-propyl-4-oxo-tetrahydrothiophene-3-carboxylate of boiling point 115°C (at 0.5 mbar).

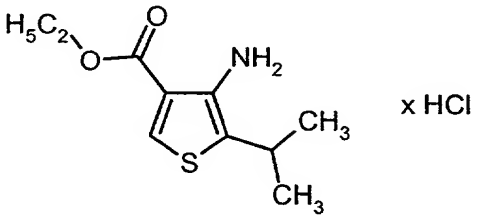
Step 2



A mixture of 38 g (176 mmol) of ethyl 5-i-propyl-4-oxo-tetrahydrothiophene-3-carboxylate, 35 g of hydroxylamine hydrochloride, 53 g of barium carbonate and 300 ml of ethanol is heated under reflux for 12 hours and then filtered whilst still hot. The filtrate is concentrated under water pump vacuum, and the residue is taken up in diethyl ether, washed with water, dried with magnesium sulphate and filtered. From the filtrate, the solvent is carefully distilled off under reduced pressure.

This give 34.2 g (86% of theory) of ethyl 4-hydroximino-5-i-propyl-dihyro-5H-thiophene-3-carboxylate as an oil which can be reacted further without any further purification.

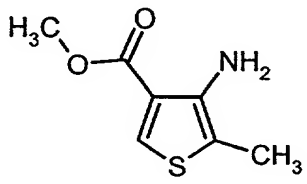
Step 3



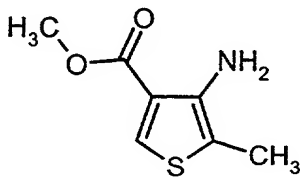
33 g (143 mmol) of ethyl 4-hydroximino-5-i-propyl-dihydro-5H-thiophene-3-carboxylate are dissolved in 250 ml of diethyl ether and, with ice-cooling, hydrogen chloride is introduced for 20 minutes (until saturation has been reached). The mixture is allowed to stand at room temperature (about 20°C) for 2 days and then concentrated under water pump vacuum, and the residue is crystallized from acetone.

This gives 13 g (37% of theory) of ethyl 4-amino-5-i-propyl-thiophene-3-carboxylate hydrochloride as a solid product.

Example (X-2)



Step 1

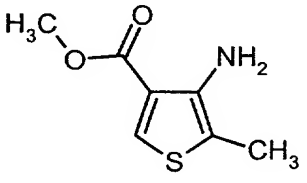


x HCl

A mixture of 310 g (1.78 mol) of methyl 5-methyl-4-oxo-tetrahydrothiophene-3-carboxylate, 155 g (2.27 mol) of hydroxylamine hydrochloride and 900 ml of acetonitrile is heated under reflux for 60 minutes. After cooling to room temperature (about 20°C), the resulting crystalline product is isolated by filtration with suction.

This gives 335 g (91% of theory) of methyl 4-amino-5-methyl-thiophene-3-carboxylate hydrochloride of melting point 132°C.

Step 2



273 g (1.62 mol) of methyl 4-amino-5-methyl-thiophene-3-carboxylate hydrochloride are dissolved in 1 litre of water, and 2 litres of methylene chloride are added below

the layer of water. With vigorous stirring, 125 g of sodium bicarbonate are then added, and the mixture is stirred for another 15 minutes. The organic phase is separated off, dried with magnesium sulphate and filtered. The filtrate is concentrated under water pump vacuum, the residue is digested with petroleum ether and the crystalline product is isolated by filtration with suction.

This gives 148 g (53 % of theory) of methyl 4-amino-5-methyl-thiophene-3-carboxylate of melting point 78°C.

Analogously to Examples (X-1) and (X-2), it is also possible to prepare, for example, the following compounds of the general formula (X):

ethyl 4-amino-5-methyl-thiophene-3-carboxylate
(m.p.: 50°C, hydrochloride: m.p.: 143°C),
n-propyl 4-amino-5-methyl-thiophene-3-carboxylate,
i-propyl 4-amino-5-methyl-thiophene-3-carboxylate,
methyl 4-amino-5-ethyl-thiophene-3-carboxylate,
ethyl 4-amino-5-ethyl-thiophene-3-carboxylate,
n-propyl 4-amino-5-ethyl-thiophene-3-carboxylate,
(oil, hydrochloride: m.p.: 140°C),
i-propyl 4-amino-5-ethyl-thiophene-3-carboxylate,
(oil, hydrochloride: m.p.: 142°C),
methyl 4-amino-5-n-propyl-thiophene-3-carboxylate,
ethyl 4-amino-5-n-propyl-thiophene-3-carboxylate,
n-propyl 4-amino-5-n-propyl-thiophene-3-carboxylate,
i-propyl 4-amino-5-n-propyl-thiophene-3-carboxylate,
methyl 4-amino-5-i-propyl-thiophene-3-carboxylate,
n-propyl 4-amino-5-i-propyl-thiophene-3-carboxylate,
i-propyl 4-amino-5-i-propyl-thiophene-3-carboxylate,

and in each case the corresponding hydrochlorides.

Use Examples:

Example A

Pre-emergence test

Solvent: 5 parts by weight of acetone

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent, the stated amount of emulsifier is added and the concentrate is diluted with water to the desired concentration.

Seeds of the test plants are sown in normal soil. After about 24 hours, the soil is sprayed with the preparation of active compound such that the particular amount of active compound desired is applied per unit area. The concentration of the spray liquor is chosen so that the particular amount of active compound desired is applied in 1000 litres of water per hectare.

After three weeks, the degree of damage to the plants is rated in % damage in comparison to the development of the untreated control.

The figure denote:

0 % = no effect (like untreated control)

100 % = total destruction

In this test, for example, the compounds of Preparation Examples 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 exhibit very strong activity against weeds, and some of them are tolerated well by crop plants, such as, for example, cotton, maize and wheat.

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Table A1: Pre-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Alopecurus	Cyperus	Setaria	Abutilon	Amaranthus	Galium	Sinapis	Xanthium
(2)	60	95	100	95	95	100	-	95	100
(5)	250	99	100	100	95	100	95	95	99
(6)	250	95	100	100	100	95	90	95	95
(7)	250	90	100	95	95	95	95	95	-
(9)	250	95	100	100	100	100	95	95	-
(10)	250	95	95	100	95	100	95	100	90

Table A2: Pre-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Alopecurus	Bromus	Setaria	Chenopodium	Matricaria	Stellaria	Veronica	Viola
(1)	60	90	90	90	100	95	95	100	100

Table A3: Pre-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Wheat	Barley	Alopecurus	Amaranthus	Solanum	Stellaria
(3)	60	0	0	80	95	90	95

Table A4: Pre-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Wheat	Bromus	Cyperus	Echino-chloa	Solanum	Stellaria	Veronica	Viola
(4)	125	20	100	100	100	100	100	100	100

Table A5: Pre-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Cotton	Bromus	Echino-chloa	Cheno-podium	Solanum	Stellaria	Veronica	Viola
(8)	60	0	90	90	90	90	95	95	100

Table A6: Pre-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Maize	Alope-curus	Digitaria	Setaria	Ama-ranthus	Cheno-podium	Matri-caria	Solanum
(11)	60	10	100	100	100	100	100	100	100

Table A7: Pre-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Maize	Bromus	Cyperus	Setaria	Abutilon	Stellaria	Veronica	Viola
(12)	60	10	100	100	100	100	100	100	100

Example B

Post-emergence test

Solvent: 5 parts by weight of acetone

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, one part by weight of active compound is mixed with the stated amount of solvent, the stated amount of emulsifier is added and the concentrate is diluted with water to the desired concentration.

Test plants which have a height of 5-15 cm are sprayed with the preparation of active compound such that the particular amounts of active compound desired are applied per unit area. The concentration of the spray liquor is chosen so that the particular amounts of active compound desired are applied in 1000 l of water/ha.

After three weeks, the degree of damage to the plants is rated in % damage in comparison to the development of the untreated control.

The figures denote:

0 % = no effect (like untreated control)

100 % = total destruction

In this test, for example, the compounds of Preparation Examples 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 exhibit very strong activity against weeds, and some of them are tolerated well by crop plants, such as, for example, barley and wheat.

Translation of the European Patent

Table B1: Post-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Wheat	Alope-curus	Echino-chloa	Abutilon	Ama-ranthus	Matri-caria	Solanum	Stellaria
(3)	15	0	70	60	95	95	90	95	100

Table B2: Post-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Wheat	Abu-tilon	Ama-ranthus	Ipo-moea	Matri-caria	Solanum	Stellaria
(4)	8	10	95	95	95	90	95	95

Table B3: Post-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Barley	Wheat	Echino-chloa	Ama-ranthus	Cheno-podium	Stellaria	Veronica	Viola
(5)	2	10	10	95	99	95	100	90	90

Table B4: Post-emergence test/greenhouse

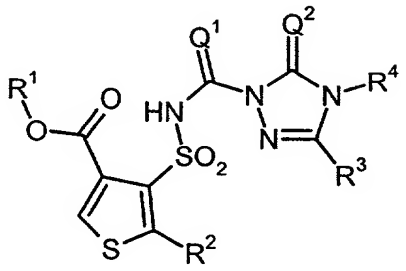
Active compound of Preparation Example No.	Application rate (g of ai/ha)	Wheat	Maize	Setaria	Abutilon	Amaranthus	Solanum	Stellaria
(10)	15	10	10	95	90	90	90	95

Table B5: Post-emergence test/greenhouse

Active compound of Preparation Example No.	Application rate (g of ai/ha)	Alopecurus	Avena fatua	Setaria	Abutilon	Amaranthus	Sinapis	Xanthium
(2)	60	95	80	100	100	100	100	100
(1)	250	100	100	100	100	100	100	100
(6)	250	100	100	100	100	100	100	100
(7)	250	95	100	90	100	100	100	90
(8)	250	100	100	100	100	100	95	100
(9)	250	100	100	100	100	100	100	100
(11)	250	100	100	100	100	100	100	100
(12)	250	95	100	100	100	100	100	100

Patent Claims

1. Compounds of the general formula (I)



(I)

in which

Q^1 represents O (oxygen) or S (sulphur),

Q^2 represents O (oxygen) or S (sulphur),

R^1 represents in each case optionally substituted alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl, heterocyclyl or heterocyclylalkyl,

R^2 represents hydrogen, cyano, nitro, halogen or represents in each case optionally substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkylsulphinyl, alkylsulphonyl, alkenyl, alkinyl, alkenyloxy or alkinyloxy,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, halogen or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylthio, alkylamino, alkylcarbonylamino, alkenyloxy, alkinyloxy, alkenylthio, alkinylthio, alkenylamino, alkinylamino, dialkylamino, aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio, cycloalkylalkyl-

amino, aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino, and

R^4 represents hydrogen, hydroxyl, amino, cyano, represents alkylideneamino or represents in each case optionally substituted alkyl, alkenyl, alkinyl, alkoxy, alkylamino, alkyl-carbonylamino, alkenyloxy, dialkylamino, cycloalkyl, cycloalkylamino, cycloalkylalkyl, aryl or arylalkyl, or

R^3 and R^4 together represent optionally branched alkanediyl,

- and salts of the compounds of the formula (I) - .

2. Compounds according to Claim 1, characterized in that

Q^1 represents O (oxygen) or S (sulphur),

Q^2 represents O (oxygen) or S (sulphur),

R^1 represents optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally cyano- or halogen-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally cyano-, halogen- or C_1-C_4-alkyl-substituted cycloalkyl or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the cycloalkyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally nitro-, cyano-, halogen-, C_1-C_4-alkyl- or C_1-C_4-alkoxy-substituted heterocyclyl or heterocyclylalkyl having in each

case up to 6 carbon atoms and additionally 1 to 4 nitrogen atoms and/or 1 to 2 oxygen or sulphur atoms in the heterocyclyl group and optionally 1 to 4 carbon atoms in the alkyl moiety,

R^2 represents hydrogen, cyano, nitro, halogen, represents in each case optionally cyano-, halogen- or C_1-C_4-alkoxy-substituted alkyl, alkoxy, alkoxycarbonyl, alkylthio, alkylsulphinyl or alkylsulphonyl having in each case 1 to 6 carbon atoms in the alkyl group, or represents in each case optionally cyano- or halogen-substituted alkenyl, alkinyl, alkenyloxy or alkinyloxy having in each case 2 to 6 carbon atoms in the alkenyl or alkinyl group,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, iodine, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-substituted alkoxy, alkylthio, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy, alkinyloxy, alkenylthio, alkinylthio, alkenylamino or alkinylamino having in each case 3 to 6 carbon atoms in the alkenyl or alkinyl group, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally methyl- and/or ethyl-substituted aziridino, pyrrolidino, piperidino or morpholino, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio or cycloalkylalkylamino having in each case 3 to 6 carbon atoms

in the cycloalkyl or cycloalkenyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl-, C_1-C_4-alkoxy- and/or C_1-C_4-alkoxy-carbonyl-substituted aryl, arylalkyl, aryloxy, arylalkoxy, arylthio, arylalkylthio, arylamino or arylalkylamino having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, and

R^4 represents hydrogen, hydroxyl, amino, cyano, represents C_2-C_{10}-alkylideneamino, represents optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy-, C_1-C_4-alkyl-carbonyl- or C_1-C_4-alkoxy-carbonyl-substituted alkyl having 1 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted alkenyl or alkinyl having in each case 2 to 6 carbon atoms, represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, C_1-C_4-alkoxy- or C_1-C_4-alkoxy-carbonyl-substituted alkoxy, alkylamino or alkylcarbonylamino having in each case 1 to 6 carbon atoms in the alkyl group, represents alkenyloxy having 3 to 6 carbon atoms, represents dialkylamino having in each case 1 to 4 carbon atoms in the alkyl groups, represents in each case optionally fluorine-, chlorine-, bromine-, cyano- and/or C_1-C_4-alkyl-substituted cycloalkyl, cycloalkylamino or cycloalkylalkyl having in each case 3 to 6 carbon atoms in the alkyl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C_1-C_4-alkyl-, trifluoromethyl- and/or C_1-C_4-alkoxy-substituted aryl or arylalkyl having in each case 6 or 10 carbon atoms in the aryl group and optionally 1 to 4 carbon atoms in the alkyl moiety, or

R^3 and R^4 together represent optionally branched alkanediyl having 3 to 6 carbon atoms,

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and the sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salts of these compounds.

3. Compounds according to Claim 1 or 2, characterized in that

Q^1 represents O (oxygen) or S (sulphur),

Q^2 represents O (oxygen) or S (sulphur),

R^1 represents in each case optionally cyano-, fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl or butinyl, represents in each case optionally cyano-, fluorine-, chlorine-, methyl- or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, trifluoromethyl-, methoxy-, ethoxy-, n- or i-propoxy-, difluoromethoxy- or trifluoromethoxy-substituted phenyl, phenylmethyl or phenylethyl, or represents in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, methoxy-, ethoxy-, n- or i-propoxy-substituted heterocyclyl or heterocyclylmethyl, where the heterocyclyl group is in each case selected from the group consisting of oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl, tetrahydrothienyl,

R^2 represents hydrogen, cyano, fluorine, chlorine, bromine, represents in each case optionally cyano-, fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, methoxy, ethoxy, n- or i-propoxy, methoxycarbonyl, ethoxycarbonyl, n- or i-propoxycarbonyl, methylthio, ethylthio, n- or i-propylthio, methylsulphinyl, ethylsulphinyl, methylsulphonyl or ethylsulphonyl, or represents in each case optionally cyano-, fluorine- or chlorine-substituted propenyl, butenyl, propinyl, butinyl, propenyloxy, butenyloxy, propinyloxy or butinyloxy,

R^3 represents hydrogen, hydroxyl, mercapto, amino, cyano, fluorine, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy, acetyl-, propionyl-, n- or i-butyroyl-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, ethinyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy-, ethoxy-, n- or i-propoxy-, methoxycarbonyl-, ethoxycarbonyl-, n- or i-propoxycarbonyl-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, acetylamino or propionylamino, represents propenyloxy, butenyloxy, ethinyloxy, propinyloxy, butinyloxy, propenylthio, butenylthio, propinylthio, butinylthio, propenylamino, butenylamino, propinylamino or butinylamino, represents dimethylamino, diethylamino or dipropylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopentenyl, cyclohexenyl, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, cyclopropylthio, cyclobutylthio, cyclopentylthio, cyclohexylthio,

cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclopropylmethoxy, cyclobutylmethoxy, cyclopentylmethoxy, cyclohexylmethoxy, cyclopropylmethylthio, cyclobutylmethylthio, cyclopentylmethylthio, cyclohexylmethylthio, cyclopropylmethylamino, cyclobutylmethylamino, cyclopentylmethylamino or cyclohexylmethylamino, or represents in each case optionally fluorine-, chlorine-, bromine-, methyl-, trifluoromethyl-, methoxy- or methoxy-carbonyl-substituted phenyl, benzyl, phenoxy, benzyloxy, phenylthio, benzylthio, phenylamino or benzylamino, and

R^4 represents hydrogen, hydroxyl, amino, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents in each case optionally fluorine-, chlorine- and/or bromine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy or butenyloxy, represents dimethylamino or diethylamino, represents in each case optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, or represents in each case optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted phenyl or benzyl, or

R^3 and R^4 together represent trimethylene (propane-1,3-diyl), tetramethylene (butane-1,4-diyl) or pentamethylene (pentane-1,5-diyl),

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and the sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salts of these compounds.

4. Compounds according to any one of Claims 1 to 3, characterized in that

Q^1 represents O (oxygen),

Q^2 represents O (oxygen),

R^1 represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl,

R^2 represents fluorine, chlorine, bromine or represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl,

R^3 represents hydrogen, chlorine, bromine, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case optionally fluorine- or chlorine-substituted ethenyl, propenyl, butenyl, propinyl or butinyl, represents in each case optionally fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methoxy, ethoxy, n- or i-propoxy, methylthio, ethylthio, n- or i-propylthio, methylamino, ethylamino, n- or i-propylamino, represents propenyl-oxy, propinyloxy, propenylthio, propinylthio, propenylamino or propinylamino, represents dimethylamino or diethylamino, represents in each case optionally fluorine-, chlorine- or methyl-substituted

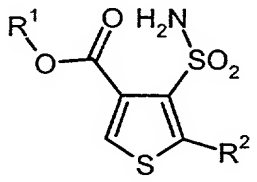
cyclopropyl, cyclopropyloxy, cyclopropylmethyl or cyclopropyl-methoxy, and

R^4 represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, represents in each case optionally fluorine- or chlorine-substituted ethenyl, propenyl or propinyl, represents in each case optionally fluorine-, chlorine-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, represents methylamino, or represents cyclopropyl,

and the sodium, potassium, magnesium, calcium, ammonium, C_1-C_4-alkyl-ammonium, di-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-ammonium, tetra-(C_1-C_4-alkyl)-ammonium, tri-(C_1-C_4-alkyl)-sulphonium, C_5- or C_6-cycloalkyl-ammonium and di-(C_1-C_2-alkyl)-benzylammonium salts of these compounds.

5. Process for preparing compounds according to any of Claims 1 to 4, characterized in that

(a) substituted thiophene-3-sulphonamides of the general formula (II)

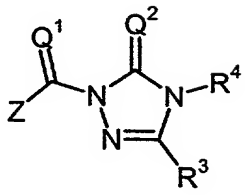


(II)

in which

R^1 and R^2 are each as defined in any of Claims 1 to 4

are reacted with substituted triazolin(ethi)ones of the general formula (III)



(III)

in which

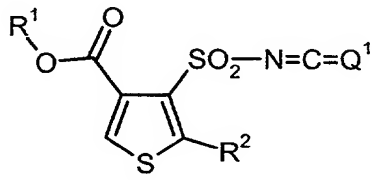
Q^1, Q^2, R^3 and R^4 are each as defined in any of Claims 1 to 4 and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or that

(b) substituted thien-3-yl-sulphonyl iso(thio)cyanates of the general formula (IV)



(IV)

in which

Q^1, R^1 and R^2 are each as defined in any of Claims 1 to 4,

are reacted with triazolin(ethi)ones of the general formula (V)

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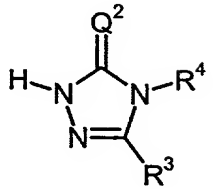


(V)

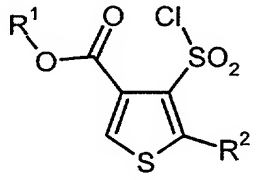
in which

Q^2, R^4 and R^5 are each as defined in any of Claims 1 to 4,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or that

(c) substituted thiophene-3-sulphonyl chlorides of the general formula (VI)

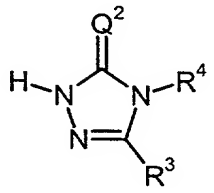


(VI)

in which

R^1 and R^2 are each as defined in any of Claims 1 to 4,

are reacted with triazolin(ethi)ones of the general formula (V)



(V)

in which

Q^2, R^4 and R^5 are each as defined in any of Claims 1 to 4

and metal (thio)cyanates of the general formula (VII)

$$M\text{-}Q^1\text{-}CN \qquad (VII)$$

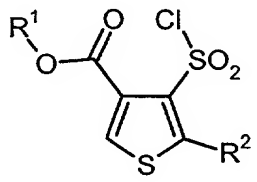
in which

Q^1 is as defined in any of Claims 1 to 4,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or that

(d) substituted thiophene-3-sulphonyl chlorides of the general formula (VI)

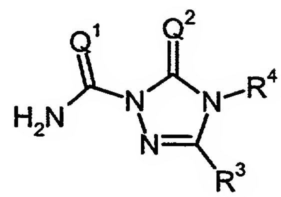


(VI)

in which

R^1 and R^2 are each as defined in any of Claims 1 to 4

are reacted with triazolin(ethi)one-(thio)carboxamides of the general formula (VIII)



(VIII)

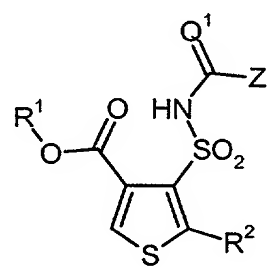
in which

Q^1, Q^2, R^3 and R^4 are each as defined in any of Claims 1 to 4,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or that

(e) substituted thien-3-yl-sulphonylamino(thio)carbonyl compounds of the general formula (IX)



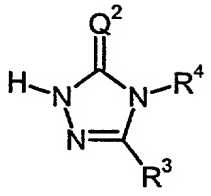
(IX)

in which

Q^1, R^1 and R^2 are each as defined in any of Claims 1 to 4 and

Z represents halogen, alkoxy, aryloxy or arylalkoxy,

are reacted with triazolin(ethi)ones of the general formula (V)



(V)

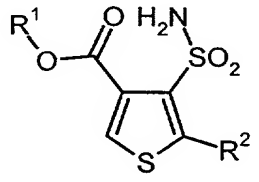
in which

Q^2, R^4 and R^5 are each as defined in any of Claims 1 to 4,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

and the compounds of the formula (I) obtained by the processes (a), (b), (c), (d) or (e) are, if appropriate, converted by customary methods into salts.

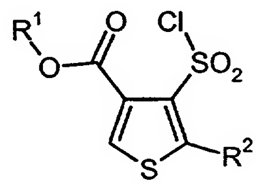
6. Compounds of the general formula (II)



(II)

in which R^1 and R^2 are each as defined in any of Claims 1 to 4, except for the compound 4-methoxycarbonyl-thiophene-3-sulphonamide.

7. Compounds of the general formula (VI)



(VI)

in which R^1 and R^2 are each as defined in any of Claims 1 to 4, except for the compound 4-methoxycarbonyl-thiophene-3-sulphonyl chloride.

8. Method for controlling undesirable vegetation, characterized in that at least one compound according to any of Claims 1 to 4 is allowed to act on undesirable plants and/or their habitat.

9. Use of at least one compound according to any of Claims 1 to 4 for controlling undesirable plants.

10. Herbicidal compositions, characterized in that they comprise a compound according to any of Claims 1 to 4 and customary extenders and/or surfactants.

COMBINED DECLARATION AND POWER OF ATTORNEY	ATTORNEY DOCKET NO

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought
on the invention entitled

SUBSTITUTED THIENE-3-YL-SULFONYL AMINO(THIO)CARBONYL-TRIAZOLIN(THI)ONES

the specification of which is attached hereto,

or was filed on **July 4, 2000**

as a PCT Application Serial No. **PCT/EP00/06276**

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s), the priority(ies) of which is/are to be claimed:

199 33 260.6	**Germany**	**July 15, 1999**
(Number)	(Country)	(Month/Day/Year Filed)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose the material information as defined in Title 37, Code of Federal Regulations, §1.56 which occured between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and this application and to transact all business in the Patent and Trademark Office conne

JOSEPH C. GIL, Patent Office Registration Number 26,602 ARON PREIS, Patent Office Registration Number 29,426 LYNDANNE M. WHALEN, Patent Office Registration Number 29,457 THOMAS W. ROY, Patent Office Registration Number 29,582 RICHARD E. L. HENDERSON, Patent Office Registration Number 31,619 GODFRIED R. AKORLI, Patent Office Registration Number 28,779 N. DENISE BROWN, Patent Office Registration Number 36,097 NOLAND J. CHEUNG, Patent Office Registration Number 39,138 DIDERICO VAN EYL, Patent Office Registration Number 38,641 CAROLYN M. SLOANE, Patent Office Registration Number 44,339 JAMES R. FRANKS, Patent Office Registration Number 42,552 JACKIE ANN ZURCHER, Patent Office Registration Number 42,251 RAYMOND J. HARMUTH, Patent Office Registration Number 33,896
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FULL NAME OF SOLE OR FIRST INVENTOR	INVENTOR'S SIGNATURE	DATE
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300 Klaus-Helmut Müller	Klaus-Helmut Müller	2001-11-23
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FULL NAME OF FOURTH INVENTOR	INVENTOR'S SIGNATURE	DATE
400 Mark Wilhelm Drewes	Mark Wilhelm Drewes	2001-11-27
RESIDENCE D 40764 Langenfeld, Germany DEY		CITIZENSHIP German
POST OFFICE ADDRESS c/o Bayer Aktiengesellschaft, D 51368 Leverkusen, Germany		
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500 Peter Dahmen	Peter Dahmen	2001-11-30
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FULL NAME OF SIXTH INVENTOR	INVENTOR'S SIGNATURE	DATE
600 Dieter Feucht	Dieter Feucht	2001-11-28
RESIDENCE D 40789 Monheim, Germany DEY		CITIZENSHIP German
POST OFFICE ADDRESS c/o Bayer Aktiengesellschaft, D 51368 Leverkusen, Germany		
FULL NAME OF SEVENTH INVENTOR	INVENTOR'S SIGNATURE	DATE
700 Rolf Pontzen	Rolf Pontzen	2001-11-30
RESIDENCE D 42799 Leichlingen, Germany DEY		CITIZENSHIP German
POST OFFICE ADDRESS c/o Bayer Aktiengesellschaft, D 51368 Leverkusen, Germany		